The Chemical Age

A Weekly Journal Devoted to Industrial & Engineering Chemistry

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Contents

	PAGE
Editorial Notes: Back from Canada; Co-ordinating Government Research; The Chemical Industry Club; A Handsome Gift; Merchants and Key Industries	445
The Calendar	447
Chemical Industry and the Stability of Peace. By MAJOR V. LEFEBURE	448
Vegetable Oil Manufacture	449
"Dryness of Pulverised Coal" (H. G. BARNHURST)	450
The Capitalistic System. By E. J. P. BENN	451
Chemical Industry Society's Annual Dinner	452
The Disposal of Waste Liquors. By EDWARD ARDERN, D.Sc., F.I.C.	454
Chemical Industry Club: Annual Report	455
September Trade Returns; Commercial Vehicles at Olympia...	456
A New Artificial Ivory Process	458
Merchants and the Key Industries Act	459
From Week to Week	460
References to Current Literature	461
Patent Literature	462
Market Report and Current Prices	465
Company News; Chemical Trade Inquiries	467
Commercial Intelligence; New Companies Registered... ...	468

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Back from Canada

MOST of the delegates who attended the Annual Meeting of the Society of Chemical Industry at Montreal are now back in England. They are all unanimous in their testimony to the warmth of their reception, to the success of the meetings both in Canada and in New York, and to the educational value of the tour. So far, however, these interesting experiences have not been reproduced in much detail or with any very quickening effect. The best impression which has yet appeared in print is conveyed by the notes contributed to THE CHEMICAL AGE by Dr. Jordan. These have since been substituted by Sir William Pope's informal and delightfully humorous address to the members of the Chemical Industry Club last week, and by the same speaker's address at the annual dinner of the Society of Chemical Industry two days later. What one would appreciate, however, would be one continuous narrative omitting the purely local and incidental detail, and recalling for those who were not privileged to attend the outstanding impressions on the most observant and imaginative minds of the party. The present was not the best time for seeing the chemical industries of Canada and the United States at their fullest. Many works, we understand, were closed down and others far from fully occupied; yet even this stagnation would be well worth description and analysis, with a view to making us appreciate the difficulties which afflict American commerce and industry, and enabling us to compare them with our own. If the Society has made no arrangements for some such comparative study of American and British conditions it has missed both a duty and an opportunity.

The speaking at the Annual Dinner, considering the rather special character of the occasion, fell a little short of expectation. Incidentally, it is difficult to understand why the members who attended should have been provided neither with a list of guests. nor even with a toast list—two conveniences which one invariably expects at such gatherings. Professor Armstrong, who proposed the toast of "The Society," was characteristically individualist in his suggestions, but the spoken word, alas, never reproduced his slashing tractarian qualities. It cannot be said that his proposals that a large body of chemists should leave these shores to find their future life work in Canada and that Lancashire should become the centre of British chemical industry instead of London, were taken too seriously. Sir William Pope emphasised once again the advantages of chemical unity, as illustrated in American experiences. So well organised is the American Chemical Society with its 17,000 members, and so fully recognised are its position and authority, that the United States Senate would hardly dare to introduce legislation affecting chemical interests without taking the Society in consultation. But how can its British sister society ever hope to attain to that position while an unimaginative minority insist that one of its main purposes is to restrict the information respecting its doings which is doled out to the public? Even in the case of the recent British Association meetings, we are told, some of these enthusiasts in the cause of suppression sought to limit the reports of the chemical contributions to that miserable sum of 500 words which they strive to invest with a sacerdotal value. The importance of chemistry to the national life will never be understood, nor will its public influence ever correspond with its work, until its spokesmen are allowed to speak without reserve to the rest of the nation; neither will it pull its full weight in national affairs while it is split up into detached and rival fragments instead of working as one organic interest. Sir William Pope has done something to make these wholesome truths a little clearer, and it is to be hoped that the liberalising influence he and others represent will steadily grow in the counsels

of the Society. Indeed, it must do, if the Society is to hold its position. Dr. E. V. Evans returned to the familiar subject of the protection of British key industries, and assured us that all was proceeding well, and afterwards Sir George Goodwin and Sir Frank Heath offered some complimentary observations on the work and position of chemistry.

Co-ordinating Government Research

EXHAUSTIVE as the new report of the Department of Scientific and Industrial Research is, one can find only one reference, and that a casual one, to the existence of a Chemical Warfare Committee. The research programmes, however, of the various fighting services have been supplied to the Department, with a view to the closest possible co-ordination of Government research work, and these have been carefully examined by the co-ordinating research boards (physics, chemistry, and engineering). Very few instances of overlapping have been discovered, but it is felt that closer co-operation between the research stations of the various fighting services will lead to greater economy of effort and increased efficiency.

Arrangements, we learn, have been made by the Chemistry Co-ordinating Research Board for investigating the possibilities of the production of formaldehyde in this country, in view of its importance in the manufacture of disinfectants and high-class insulating materials, and of the fact that supplies are at present almost entirely imported or made from imported materials. Researches will be conducted on behalf of the Board at the Royal Naval Cordite Factory, Holton Heath, and at the Research Department, Woolwich, and a grant to Mr. D. L. Chapman, F.R.S., of Oxford University, has been authorised to enable him to employ an investigator. A different method of attacking the problem is being pursued in each of these investigations. The desirability of further Government research into the problems of nitrogen fixation has been considered; in the Board's opinion, no further action is necessary at present, but the general position is being kept under view. The Board has attempted to secure a supply of helium to meet the demands of scientific research in this country, and for research into possible commercial uses, but they have so far been unsuccessful. On behalf of the Board, a joint research is being undertaken by the British Scientific Instrument Research Association and the National Physical Laboratory into luminous paints. A special sub-committee, consisting of members of the three fighting services, acting in co-operation with the British Electrical and Allied Industries Research Association, has been formed to examine the possibilities of further research into the development of accumulators and dry cells.

Sir Robert Robertson, F.R.S., the Government chemist, has been appointed as an additional member of the Board. It has been found that many of the problems confronting the Chemistry Board have already been engaging the attention of the Government Laboratory, and assistance has accordingly been given to the Board by officers of the Laboratory. It is hoped that the results of such co-operation will be extremely valuable to the Board in the future.

The Chemical Industry Club

THE Committee of the Chemical Industry Club (whose annual report is published on another page) may be congratulated on having maintained the position of the institution—now the recognised social centre of chemical industry—so well during a year of exceptional difficulty. Nominally the membership has advanced from 715 to 757 in spite of deaths and resignations to the number of 62, but against this some 67 members have been lost sight of, and following the sound conservative policy which has been adopted from the beginning, the Committee have written down the active membership to 690 or 25 fewer than last year. Owing to the absence of Capt. Goodwin in Canada, the usual financial statement has not yet been circulated, but it is satisfactory to know that the Club has paid its way and that the balance in hand has been maintained. Owing to the depressed condition of trade the Committee have hesitated to embark on any experimental enterprises; at the same time there have been quiet and natural extensions which have added to the Club's usefulness and which, under more favourable conditions, will no doubt be continued. Among these developments may be included the monthly meetings and addresses, the attendance at which already overtaxes the accommodation and has raised the question of securing a more commodious meeting-place for special gatherings.

One promising sign is the intercourse which the Club has encouraged between various scientific societies, and the increasing extent to which the hospitality of the Club is appreciated by other bodies. Among the withdrawals from the present Committee those of Mr. Bernard F. Davis, who acted for a time as Hon. Secretary, and of Mr. Brewis and Mr. Ridge, who have especially interested themselves in the membership, will be particularly regretted. As against this the Club may hope to gain substantially from the help which Mr. W. Cullen has undertaken to give to Mr. H. E. Coley as Assistant Hon. Secretary. At the final Committee meeting for this year occasion was taken to thank Dr. Hodgkinson very cordially for the valuable work he has done as Chairman of the Committee from the establishment of the Club. At the annual general meeting on Monday next it is proposed that the rules should be so amended as to provide that in future the Chairman of the Executive Committee shall hold office for one year only and shall not be eligible for re-election until after the lapse of one year. The third annual dinner of the Club has been fixed for the Connaught Rooms, on Friday, November 18, and there is every reason to expect a repetition of the signal success of last year's gathering.

A Handsome Gift

THE handsome gift of £20,000 which Sir Edward A. Brotherton, M.P., has just made to the University of Leeds, is the largest the university has yet received, and as the university has power in the case of munificent donations to attach the owner's name to a building or department this would seem a fitting occasion for giving effect to this provision. Sir Edward's donation is intended for the endowment of a Chair of Bacteriology and the promotion of bacteriological study and research in the interests of public health. The donor has long

been prominently associated with public life in Yorkshire, and few causes have appealed to him more than that of improving the standard of public health. As chairman of the University Advisory Committee on the Department of Pathology and Bacteriology, he has become impressed with the close bearing of these fields of research on public health, and through his public-spirited act the university's capacity for a vital public service will be sensibly increased.

Though widely known as the member of Parliament for Wakefield, as a former Lord Mayor of Leeds and in other public capacities, Sir Edward Brotherton is more particularly known in chemical circles as the head of Brotherton & Co., Ltd., ammonia and tar distillers, who have their headquarters in Leeds and control important works at several other centres. Their latest acquisition, in 1918, was the German-owned aniline dyeworks at Bromborough Port, Birkenhead, which were purchased at a cost of £135,000. Sir Edward has no hesitation as to the attitude of British chemical and dyestuff manufacturers towards German competitors. In a message he contributed, together with a number of other public men, to the first issue of THE CHEMICAL AGE, he frankly declared that the policy which should be followed in order to maintain and still further develop British chemical industry is to prohibit the import of foreign manufactured chemicals except under licence from the Board of Trade. Users should be required to deal with British makers unless they can show either that the product is unsuitable or that the manufacturer of it is taking advantage of the situation to exact too great a profit.

Merchants and Key Industries

INQUIRIES in the chemical trade reveal a widespread feeling of anxiety respecting the operation of the Key Industries Act. No one could seriously have expected such a measure to come into operation without producing many of the effects now complained of. But the effects appear to be wider and more severe than was anticipated. The most specific and common complaint is that numbers of articles are included in the Board of Trade list which have no relation to Key Industries, and that the Act has been enlarged from a measure for the temporary safeguarding of nascent industries into one of a more broadly fiscal character. Already there is talk of a movement in favour of its appeal, though one cannot see much prospect of success here. It might, however, be possible, if a sufficient amount of pressure could be brought to bear, to reduce the present list of articles to narrower dimensions, and thus afford a certain amount of relief. Two courses are being considered on behalf of chemical traders. The British Chemical Trade Association suggests a deputation to the Board of Trade, but experience of previous deputations of this character will moderate any expectation of effectual results. The Chemical & Dyestuffs Traders' Association contemplates another course—the organisation in connexion with the London Chamber of Commerce of a joint conference, representing both the associations named, as well as the chemical and fancy trades sections of the Chamber. This would give an opportunity of thoroughly discussing the situation in the light of actual experience, and of formulating an authoritative case to be laid before the Government. Incidentally, it might also prove a useful step towards that consolidation of merchant interests which is so much to be desired.

The Calendar

Oct. 17	Chemical Industry Club: Annual Meeting	2, Whitehall Court London.
17	University of London: "Liquid Fuels." Harold Moore. 5.30 p.m.	King's College, Strand, London.
18	Hull Chemical and Engineering Society: "Wrapping Machinery." F. Glover. 7.30 p.m.	Wilberforce Café, Waterworks Street, Hull.
19	Society of Glass Technology: "Properties of Dolomitic Lime Glasses and the Commercial Application," and "Note on the Composition of Glass House Pots in Olden Times."	The University, St. George's Square, Sheffield.
19	The Industrial League and Council: "Economic Axioms of Industry." E. W. Petter. 7.30 p.m.	Caxton Hall, Caxton Street, Westminster, London.
20	Chemical Society: 8 p.m. ...	Burlington House, Piccadilly, London.
20	Society of Dyers and Colourists, West Riding Section: "The Dyeing of Artificial Silk." J. F. Briggs.	Bradford.
21	Society of Dyers and Colourists, Manchester Section: "General Aspects of the Cotton Fibre and Mercerisation." H. A. Lowe.	Manchester.
21	University of London: "Nutrition." Dr. J. C. Drummond. 4.30 p.m.	South Kensington.
29	British Association of Chemists: Annual General Meeting. 3 p.m.	Midland Hotel, Manchester.
Nov 18	Chemical Industry Club: Third Annual Dinner.	Connaught Rooms, London.

Books Received

BLEACHING. By S. H. Higgins. London: Longmans, Green & Co. Pp. 137. 10s. 6d. net.

THE CHEMISTRY OF COLLOIDS. W. W. Taylor. London: Edward Arnold. Pp. 532. 10s. 6d. net.

AN INTRODUCTION TO ORGANIC CHEMISTRY. By D. LL. Hammick. London: G. Bell & Sons, Ltd., pp. 258. 6s. net.

NOTES ON INORGANIC CHEMISTRY. By F. Francis. Bristol: J. W. Arrowsmith, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. Pp. 244. 8s. 6d. net.

LABORATORIES: THEIR PLANNINGS AND FITTINGS. By A. E. Munby. London: G. Bell & Sons, Ltd. Pp. 220. 25s. net.

JOURNAL OF INDIAN INDUSTRIES AND LABOUR. Vol. I. Part 3. Pp. 409.

PETROLEUM. Prepared jointly with H.M. Petroleum Department with the co-operation of H. B. Cronshaw. London: John Murray. Pp. 110. 5s. net.

BARIUM MINERALS (1913-1919). The Mineral Industry of the British Empire and Foreign Countries. Imperial Mineral Resources Bureau. London: H.M. Stationery Office. Pp. 26. 9d. net.

ALUMINIUM AND ITS ALLOYS. By C. Grard. London Constable & Co., Ltd., pp. 184.

CHEMICALS AND INDUSTRIAL MATERIALS WITH THEIR COMMERCIAL USES. Compiled and published by Charles Argles.

CONFECTIONERS' RAW MATERIALS. By James Grant. London: Edward Arnold & Co. Pp. 173. 8s. 6d.

Chemical Industry and the Stability of Peace

By Major V. Lefebure

Major Lefebure, who is well known as a student of chemical warfare, and has just published an interesting work on the subject entitled "The Riddle of the Rhine," discusses below the questions of chemical disarmament and technical initiative.

THE British organic chemical industry is faced with a very stiff uphill fight. Can it win through? It is, to a certain extent, a question of our own exertions. But German competition, adverse economic conditions, and the interplay of both, find our industry more vulnerable than the many others which they threaten. In no other case is the issue so important. I say, without any hesitation, that if we lose at this point of the economic struggle, if our organic chemical industries fall to pre-war magnitude, or succumb, then Britain will be faced with a calamity of the first importance. The loss of this vital industry would be, to us, greater than that sustained by Germany in the yielding of her Navy. It is, then, anomalous that the victory which gave us the latter should not have been able to safeguard the former. German disarmament was the first duty of the Treaty. Universal armament limitation is the first duty of the League. Neither show signs of having realised or accepted the fundamental importance of chemical science and industry in the disarmament scheme. It would be idle to deny the valuable results of the educational campaign which has steadily increased during and since the war. It has led, for the first time, in this country to a public realisation of the importance of chemistry for war and as a key to many of the industrial processes of peace.

Yet this is not enough. The force thus created cannot find outlet unless we can demonstrate in detail how chemistry and chemical industry have incidence upon and play their part in the big general international problems. It is no secret, for example, that the chemical measures actually incorporated in the Treaty fell far short of the desire of Lord Moulton and those associated with him in Paris. The importance and meaning of chemical armament and disarmament were certainly appreciated and urged by the few chemists privileged to witness or take part in the peace negotiations. Yet the Treaty and the Covenant of the League give but a dim reflection of these efforts. They were not completely understood.

Forthcoming events, however, give and call for renewed hope and effort. It is now being urged that chemical disarmament be raised to the level of the big problems accepted for discussion at Washington. The educational campaign must be revived, but on different lines. We must take up with emphasis the big strategical and international issues of our case.

I think my meaning can be made clear by attempting answers to two very simple questions:

First, wherein lies the special importance of chemical warfare as compared with other weapons?

Does it depend on its peculiar atrocity? With all due respect to Sir Edward Thorpe's remarks in his presidential address to the British Association, it is impossible and even dangerous to differentiate between the atrocious nature of modern weapons. First-hand acquaintance with the battlefield, with the effect of German machine-gun fire upon our own men at Loos, for example, and of our H.E. bombardment upon the Germans on the Somme, leaves one aghast at the whole business. The mode of introduction of gas was atrocious, but further differentiation is pointless. All modern weapons are atrocious and terrible. The whole machinery of war should be put out of action. In any case, mere atrocity will never conquer a civilised people. It does not answer our question.

It is a fact that gas gave many more casualties for a given expenditure of military energy than any other weapon. This is amply borne out by the losses of the American Army, which operated in the period of most intensive gas warfare. Here is a great factor in the chemical warfare case, but it is not all. The real answer is this. Chemical warfare introduces a new initiative in war. I have called it the technical initiative. The germ of the idea existed centuries ago, when Cortes conquered Mexico by improvising gunpowder, and, more prominently, in the latest moves of naval warfare. It consists in the sudden development of a weapon against which there is no counter. Exploited on a large scale, this initiative spells decisive power. Analysed on these lines, the recent chemical campaign becomes nothing more than the first few of a series of vital moves, German thrusts against which, for the moment, we had no counter. They would have been decisive but for two reasons. Fate was merciful, or the Germans were over-cautious, and no one surprise was exploited on a sufficiently large scale to be actually decisive. Secondly, the excellence of our protective organisation and the difficulty of secrecy with the two armies locked in battle enabled us to react very rapidly to each new attack. On several occasions, however, our margin of safety was extremely hazardous. But in war these counter-efforts were assisted by every possible means, by vast intelligence schemes and converging lines of aggressive and protective research. In peace, however, the lines of research will diverge. Potential opponents will lose contact and develop closely guarded means of chemical aggression against which no counter may have been conceived.

Twenty years or more of peace will provide a wonderful opportunity for a nation, chemically endowed, to develop the ideas on which to base the technical initiative should she wish to use it. This is the answer to our question, and therein lies the distinguishing and decisive characteristic of chemical warfare. The nation that finds, and guards the knowledge surrounding the persistent lethal compound, and its method of military application, for example, will possess a hitherto unequalled power for war, the technical initiative. *But there is one important qualification.* This brings us to the second question.

What is the special relationship between these chemical developments and disarmament?

Let us analyse very briefly the disarmament aspect of the different stages of development of any new weapon. Clearly, it must pass through invention or research, larger scale trials in field and factory, and actual manufacture. It is not sufficiently realised that no invention, however deadly, can have any real incidence on war without large scale manufacture. Without the latter, you can have no casualties. The nation with only one telling idea, exploited for war through a monopoly of production, is infinitely more powerful than another with a thousand far more brilliant inventions, and no industry, to convert them into casualties or a threat. Further, disarmament measures, however well supported, even backed by all the goodwill in the world, cannot guarantee the suppression of scientific invention or research of potential military value. Disarmament must therefore tackle large scale manufacture. This cannot be repeated too often, because it has been so grossly overlooked hitherto. What types of manufacture contribute to armament? Broadly, there are two, mechanical and chemical. Here again a simple fact emerges whose very simplicity has caused its neglect. As propellants, high explosives and poison gas, the main casualty producers are chemicals. Rule them out and you reduce war to mediæval proportions, a war of bayonets, bows and arrows and slings. Broadly, but exactly, mechanical armament merely provides a means to exploit the real casualty producers, the chemical. It might still be, however, that the control of a certain key feature of mechanical armament such as the projector, a general term for all guns, would check the use of the chemical. But the introduction and growing importance of the third class above, chemical warfare or poison gas, renders such a course alone worse then useless. One of the main features of later developments in this field was the appearance of special chemical appliances rendering the actual chemical independent of normal artillery for its use and aggressive effects.

There is but one conclusion. The key disarmament measure is the control of these chemical developments. This means the control of the industries which exploit them. If this were realised at Washington, it would raise the question of the organic chemical industries to an entirely new level. It would become their first duty to destroy the threat of the renewed German

monopoly. The representatives would be faced with the real issue involved in "private manufacture of munitions," faced by a new meaning which dwarfs in importance the narrow conception on which so much thought, time and energy are now being expended at Geneva and elsewhere.

A new inspiration is thus provided for National legislation to protect the dye and the other organic chemical industries. Such legislation represents a disarmament measure of practical importance in that it tends to stabilise a condition in which a redistribution of organic chemical capacity replaces the pre-war monopoly position. Above all things we want to see the League, and the Washington Conference, and any similar organisations or meetings which may follow, setting a seal upon and stabilising these laborious National efforts. This implies some measure of control which gives to each civilised country a fair proportion of the world's markets. All such proposals share the reproach of impossible idealism which will attach itself to all serious disarmament measures. But we shall never obtain a stable peace without some drastic attempt to convert the ideal into a practical measure.

Vegetable Oil Manufacture

Relative Merits of the Solvent and Pressing Processes

In the manufacture of vegetable oil from oleaginous seeds and nuts the two chief processes used have hitherto been: (1) simple pressing in powerful hydraulic presses; or (2) extraction by solvent, usually benzol in this country or gasoline in the U.S.A. Expert opinion seems to be fairly equally divided as to the relative merits of these two processes, and from time to time they form the subject of more or less acute controversy. The whole subject of vegetable oil manufacture was gone into very fully recently by Mr. R. A. Bellwood, M.I.M.E., in three lectures delivered at the Manchester Municipal College of Technology, with special reference to his new centrifugal process which forms the subject of English patent No. 124,856. Meantime some very exhaustive and apparently quite impartial tests have been carried out with cotton seed oil by the U.S.A. Bureau of Plant Industry in order to determine the relative quality of expressed cotton seed oil, as compared with the solvent extracted oil, and also to determine the changes necessary in present mill practice to obtain, by solvent extraction, a high-grade product.

Samples of cotton seed and of expressed oil were obtained. The seed was passed through a fanning mill to separate the hulls which were found to be present to the extent of 4 per cent., and the mass was finely ground and extracted with benzol in two separate lots. One of these served as control whilst the other was put into a separate vessel together with several rusty iron screens, some wire nails and a wrought-iron bar, in order to determine the effect on the resulting oil of an excess of iron, such as is experienced with iron retorts. Actual tests with iron retorts would, however, seem to have been preferable, and more comparable with actual conditions. In both cases the masses of meal and solvent were heated to about 35°C., and allowed to stand overnight. The oil benzol solution was filtered from the meals into suction flasks; the meals were solvent-dried, reground, and again treated with benzol as previously, one for control and one for effect of iron. On the second day following the solutions were poured off, filtered, and added to the first extracts. Most of the solvent was recovered by boiling off over a steam bath at ordinary pressure, and afterwards low-pressure steam was cracked into the solution, and the distillations continued at temperatures of about 70°C. for 15 to 30 minutes, by which time the odour of benzol had disappeared.

The three oils, namely hydraulic pressed, solvent extracted control, and solvent extracted iron-treated, were refined with sodium hydroxide. The colour of the solvent-extracted oil in both samples (2 and 3) was found to be unsatisfactory, and the customary official method of refining would have to be modified in order to obtain an oil comparable to the expressed oil. The following four methods, designated A, B, C, D, were tried:—

A. After refining with the official method with 16°Bé lye, and the soap stock removed, the oil was further treated with 2 per cent. of 21°Bé lye, well stirred, then with 1 per cent. water heated slowly to 45°C. and settled.

B. The oil was refined by adding 10 per cent. excess of 16°Bé sodium hydroxide solution, heating to 45°C., cooling to 30°C., and, without removing the soap-stock, re-refining with a volume of 21°Bé lye equal to that of the 16 deg. lye, again heating to 45°C., and settling as usual.

C. The oil, after the official refining method, using 16°Bé lye and separation of soap-stock, was treated with 2 per cent. of 21°Bé, slowly heated to 45 deg. and settled.

D. After usual official treatment and separation of soap-stock 2 per cent. of 26·5°Bé caustic solution was added, the batch heated to 45°C, 1·3 per cent. water added at 45 deg., stirred and settled.

The U.S.A. official method of bleaching was used, namely, with 6 per cent. standard fuller's earth at 110°C. for 15 minutes. Colour was read in a 2-inch cell, after Lovibond. Deodorisation was effected by heating to 200°C. in a glass flask under about 27 inches vacuum for one and a-half hours, using low-pressure trap-dry steam.

An exhaustive series of tests was carried out by these methods and was described in detail by Dr. J. H. Shrader in the official Monthly Bulletin of the Interstate Cotton Seed Crushers' Association. Among the chief results obtained it was found that cotton seed oil when extracted in the presence of metallic iron exhibits specific colour effects which are more difficult to remove than when the process is carried out in glass or tin-lined vessels. This confirms experience in this country. Another general result, not, however, regarded as conclusively proved, was that expressed oil is superior to extracted oil—in the case of cotton seed oil; but it was still hoped that it might be possible, by modifying the milling methods, greatly to improve the solvent-extracted oil. The colour of the oil is of course one of the most difficult things to control, and it is also the most important; in fact, the colour, as determined by the Lovibond colourimetric scale, is the chief criterion of quality.

In using method B it was found very advantageous to cool the oil after the first heating to 45 deg., and before the second dose of caustic, as if this was not done the colour of the oil was very red and unsatisfactory, even when the refining was done in benzol solution. It is well known that the more or less prolonged heating of the oil tends to darken it, and since extracted oil is subjected to distillation to remove the solvent, followed by steam blowing, it was thought that this double-heat treatment would adversely affect the colour. Some tests were accordingly devised definitely to clear up this point, and the conclusion drawn therefrom was that heating during solvent removal did not appreciably darken the oil. The effect of distilling in the presence of metallic iron was also tried, and it appeared that contact with iron may not materially affect a pressed oil, but does tend to darken an extracted oil, and the interesting hypothesis was adduced that benzol—in the solvent extraction method—extracts some constituent of the seed which reacts with metallic iron, forming a darkening product, whereas, in hydraulic pressing, no such constituent is separated. It is a pity that alleged lack of funds prevented further work in this direction, or a repetition of the same tests, but the results so far are certainly interesting.

Refining Oils in Solvent

In 1919 Dr. Wesson, the well-known specialist in this field, suggested that extracted castor oil should be refined in solvent, and it was thought a similar method might be applied to cotton seed oil. Results of experiments carried out seem to justify the conclusion that a lighter-coloured extracted oil can be obtained by refining in solvent, but this advantage is strictly confined to the extracted oil and does not extend to pressed oil. Another advantage is that foaming during distillation of solvent is prevented, and loss of benzol during refining can be controlled by using a closed tank with condenser. On the other hand, the problem arises of removing solvent from the soap stock. Dr. Shrader here expresses the opinion that it seems preferable to concentrate on perfecting the whole operation of extraction and refining and introduce as

few changes as possible rather than introduce too radical changes and develop new technique. This is a view that could doubtless be disputed, and possibly entirely new methods, involving fundamental changes, are required; at the same time, every effort should, of course, be made to perfect present methods. Both the improvement of present methods and the discovery of entirely new ones would prove an interesting and valuable field of research, in view of the great and growing importance of the edible oil industry, and, as a matter of fact, some important work is now being done in this field.

Effect of Hulls on Quality of Oil

So far no attempt had been made entirely to remove the hulls from the cotton seed meat, and they were present from 4 to 10 per cent. In the hydraulic-pressing process it is generally recognised that a certain percentage of hulls is necessary to insure the right texture in the cake. The amount of hulls present often goes up to 13 per cent. It was supposed that the hulls could easily have an important influence on the colour of the oil, and this was confirmed by experiment. It was decided to test the effect of entirely removing the hulls. A batch of seed was decorticated, separated from the hulls in a fanning mill, and divided into two lots, one of which was entirely freed from hulls by hand-picking, and the other had its percentage of hulls raised to 13 per cent. The two lots were ground separately and each extracted twice with benzol. The oils were freed from solvent, refined by the official method, already described, and bleached. The colours were read in a 2-in. Lovibond cell. A second batch consisted of ground meats and hulls ready for grinding and rolling just before pressing. This lot had been prepared about six weeks ago, and was therefore highly rancid. It was likewise divided into two lots, one free from hulls and the other containing 13 per cent. hulls. The results are shown in the following table:—

	Acidity	*Refining Loss*	*Colour Refined*	*Colour Bleached*
Lot A (fresh)—				
Without hulls	1·3%	7·4%	37/2	4·5/0·7
13% hulls ...	2·13%	6·0%	44/3·2	17/1·2
Lot B (rancid)—				
Without hulls	9·7%	—	39/2·2	5/0·7
13% hulls ...	9·0%	—	—	—

The rancid lot containing 13 per cent. hulls could not be refined at all, which is hardly surprising. The oils from lots A and B, free from hulls, were added together and deodorised. The colour was 5·8/1·5 (16/2·5 in standard cell).

It was concluded that the hulls were mainly responsible for the quality of the oil, and it was clearly evident that the greater the percentage of hulls the darker the oil, the higher the acidity and the greater the loss in refining. These results are, of course, still more marked with rancid oil. The hull percentage must be reduced to a minimum. It is claimed that by using the most improved milling and separating machinery the hulls can be reduced to 1 per cent. of the meats, and it is proposed to extend the experiments further under actual factory conditions.

The whole question of solvent extraction versus hydraulic pressing is a very complex one, and many factors are involved, the chief of which are the kind of oilseed to be dealt with, cost of solvent, the purpose for which the oil is required, and the relative demand for oilcake (from pressing) or meal (from extraction). For the economic running of an oilmill it is necessary, as a rule, to have a great diversity of raw material, and therefore the ideal kind of machinery is that which is capable of dealing with different kinds of oilseeds and nuts without much modification or adjustment. This, indeed, seems to be Mr. Bellwood's chief problem, namely, that of designing—on a manufacturing scale—a centrifugal machine that would work continuously on different kinds of material.

In the foregoing some reference has been made to one or two special factors which occur in the case of cotton seed oil. In fact, the question as to which process is best is meaningless without reference to the particular material to be dealt with and the other factors involved, and no vague generalisation can hold good. The training and skill of the operators have, of course, a lot to do with success or failure, and each claims his own method as the best. For instance, the "expressionists" claim that there is very little impurity in the oil, that it refines easily to an edible quality, but that solvent-extracted oil, on the other hand, contains large quantities of extractive material other than oil, that the colour is wrong and not easily righted, and that both oil and meal contain solvent to such extent as to be unfit for man and beast. The "extractionists," again, claim that there is less foreign matter in extracted oil than in expressed oil, that neither oil nor meal need contain any appreciable residue of solvent, and that, with proper refining, edible-quality oil can be obtained. The controversy around the two methods is rather acute in regard to coco-nut oil, but in the case of rapeseed oil and soya-bean oil the solvent method seems to be preferred. In the case of linseed oil the two methods are pretty much on an equality, and in regard to cotton seed oil the pressing process has been greatly preferred.

A new and interesting line of research which has been very recently opened up is the testing of new solvents, especially trichlorethylene, but there is not space to describe this fully. It may be said, quite generally, that benzol appears to be holding its ground in the oilmilling industry.

"Dryness of Pulverised Coal"

To the Editor of THE CHEMICAL AGE.

SIR,—The writer has read with interest an article entitled "Dryness of Pulverised Coal" appearing in THE CHEMICAL AGE under date of July 2, 1921.

We do not know where the information was obtained on which this short article was based. There are only one or two pulverised coal installations in the United States out of a total of nearly 300 which do not have dryers. The Alleghany Steel Co., who do not use dryers in their pulverising plant, are located directly at a mine where the moisture content averages very low as received. The second important installation is at the Ford Motor Co.'s plant at River Rouge, near Detroit. The pulverised coal installation in this plant has an auxiliary method of firing in connexion with coke-oven gas. The plant has just been completed and put into operation, and there has been no definite developments there, proving that dryers are not necessary for the successful operation of the pulverised-coal installation.

At the new Lakeside plant of the Milwaukee Electric Railway & Light Co., where nearly 1,000 tons of pulverised coal are used daily, it has already been proved that the use of coal dryers is essential to the satisfactory operation of the plant. Four direct benefits are obtained by the use of properly designed dryers. Of these the first is the improvement in pulverising conditions which is bound to occur as the moisture content is reduced. The second is the greater efficiency obtainable, both theoretically and practically, when the moisture is eliminated before the coal reaches the boiler furnace. This is due to the fact that the gases from the dryers pass away at considerably lower temperature than the gases from the furnace. In the third place, although coal may be obtained with a very low moisture content in a given locality, this moisture content is bound to vary, and will usually rise at times to a degree which will make pre-drying essential to the proper preparation of the coal. In the fourth place, no one other factor can make so much trouble in the handling and distribution of pulverised coal as moisture. Inasmuch as the drying process increases the ultimate efficiency of the combustion of fuel, it may be considered an essential part of the preparation of pulverised fuel, except under very unusual and localised conditions.

In reference to fineness it is the writer's opinion that recommendations should call for coal to be ground so that 95 per cent. or over would pass through the 100 mesh screen, and 80 to 85 per cent. through the 200 mesh screen, and that this fineness should be generally followed so as to cover all coals, particularly during the present stage of development of this method of burning, but just how any particular coal should be prepared depends strictly upon the coal in question and on the amount of volatile and ash in the coal. Furthermore, those who have had the most experience in the burning of anthracite and other low volatile coals are recommending that such coals be pulverised to an even higher degree of fineness. All of the writer's experience indicates that the highest combustion efficiency can be obtained only when the coal is ground to a high degree of fineness and thoroughly dried.—Yours, etc.,

FULLER ENGINEERING CO.,
H. G. BARNHURST, *Advisory Engineer.*
Allentown, Pa., U.S.A.

The Capitalistic System*

By Mr. E. J. P. Benn, C.B.E.

I

It seems almost impossible in these modern times for a politician to make a speech without some reference to the "System." Newspaper articles are almost as bad. We have all fallen to talking of something which we call the "System," and most of us are engaged in either amending or abolishing the "System." The amount of thought that is put into the "System" seems to be almost negative, except by way of criticism. The result of this state of affairs, as I see it to-day, is that we are all of us gradually losing heart in our work, losing interest in our day by day occupation. We are getting back to the condition of the old-fashioned Christians who, you remember, mournfully toiled through this brief vale of tears only on condition that there was an early release to some happier world beyond.

The result of this attitude of mind, economically, seems to me to be extremely serious. It explains what Mr. Lloyd George told us last week—the fact that we are only giving 80 per cent. of our pre-war output, when we know that our capabilities in the matter of output are very much in excess of the pre-war figure. The fact is that this constant tilting at the System has taken most of the enterprise out of us, and it is the exception rather than the rule to find either a working man or an employer who is putting his best, his intelligence and his heart as well as his hand, into the job that he has to do.

There is a further reason why I suggest that it is our duty in this generation to inquire very closely into what is called Capitalism. It is that we are in a better position than any previous generation, a better position, I hope, than any future generation will be in, to study the workings of economic law. We have been through Armageddon and have been subjected to every conceivable sort of experience and experiment, and are therefore the better able to discuss this matter.

Now what is called the Capitalistic System has its foundations in exchange. Exchange is at the very bottom of it. Early man, when he produced a bag of corn and required a sheep, was under the necessity of going out among his neighbours and finding somebody who not only wanted a bag of corn but who was willing to part with a sheep, and thus effect a very laborious and difficult exchange. Since those days, right down to the present moment, the essential exchange basis of our trade and industry has never been touched, and in my judgment never will be touched. Things have become so complicated, the machinery of exchange has been so developed and made so wonderful, that it is very difficult for many of us to realise that we are actually engaged day by day and hour by hour in exchanging some service or some goods which we possess for the services and goods of others who are willing to accept our service in exchange for theirs. I am a journalist: I earn a living by scribbling for the Press. When I undertake a railway journey and a porter labels my luggage it is a little difficult for me or for him to realise that he is in effect exchanging that service for so many inches of something which I wrote for an American paper the week before. But the fact remains that actually that is what is happening. We have developed this business of exchange to such a point that we can any of us walk out to a shop at the street corner, without any previous argument or arrangement, and exchange our services for those of others spread in the farthest corners of the earth.

The next big feature of what is called the Capitalistic System—a most unfortunate designation, in my judgment—is that it is essentially a consumers' system. You will notice, if you come to think of it, that the business of exchange must always in the nature of things be slightly weighted in favour of the buyer. That is not a "system" invented by wicked persons for the purpose of acquiring riches, it is a characteristic of the human being which we have to admit and deal with as it is. Imagine me a maker of umbrellas. It is necessary for me every day and every hour to persuade somebody to accept my umbrellas in exchange for something which I want; but you, the user or consumer of an umbrella, have this advantage—that you may be a simple-lifer and prefer to do without an umbrella; you may think a macintosh is better, or you may delay the purchase of the umbrella until to-morrow; and in that way, that very simple and very natural way, the process of exchange is always slightly weighted in favour of the consumer against the producer. From that fact, as I see it, arises this talk of wage slavery. It is perfectly true—although the term is an exaggeration—that in the ordinary working of human affairs through the process of exchange the producer must be subordinate to the consumer, and, if you like, must be the slave of the consumer. But, after all, supposing it were possible to alter it—though I am one of those who deny that any radical alteration is even thinkable—but if in theory you can imagine a system whereby the balance was weighted in favour of the producer, you would merely have a system of slavery as consumers instead of slavery as producers.

The charm, or the perfection of the system of exchange known as Capitalism is this, that every act we do, every thing we offer, every article we produce for the benefit of others, is subject always to the test of the appeal which it will make to others. In offering our service in a free market to the rest of our fellow-creatures we are subject at every moment of our service to this test—the willingness of others to pay for it—which is the only way in which they can express their appreciation of that service rendered. The Capitalistic System might be described as the perfect application of the democratic idea to the economic sphere.

Let us go a little deeper into this matter of profit and consider what it is and how it arises. Let us build up an imaginary case, a simple case, and a bad case. Imagine, if you will, a number of men digging a hole to extract, say, coal from the bottom, laboriously carrying that coal up to the top and ekeing out some sort of existence in that arduous way; then I, a rapacious, objectionable, shameless profiteer come along with a rope and a pulley and I say to these men, "Now, if you will use this rope and this pulley you can haul up ten times the amount of coal from the bottom of that hole for the same effort that you were exerting before." That seems a good proposition I further say, being this horrible profiteer, "But if you use this pulley and rope you must give me one basket in ten of the coal that comes to the top." Having made that bargain, I go to sleep at the top of the hole, as a profiteer would, and the men proceed to haul up for themselves nine times the product that they were previously getting, while I, being asleep, have all the time piling up by my side a heap of wealth which under that iniquitous bargain is mine. Now, that is a pretty bad case of a profiteer, about as crude and immoral as I think perhaps it is possible to construct. But let us face the facts. Every civilised country in the world has found such an urgent need for pulleys and ropes that it has gone out of its way to invent legislation and say to us all, "If you will produce a pulley and a rope we will give you Letters Patent and so many years during which you can exploit this pulley and rope to your heart's content." And that has been done by democratic governments guided by all the wisdom that we collectively possess. And at the end of it we are woefully short of pulleys and ropes and earnestly praying for more people to produce pulleys and ropes to help us to get along.

You will say, "Oh, it really is too absurd for words!" But I doubt it. Personally, I am firmly convinced that the genius who first had the temerity to suggest that a bit of rope over a round thing called a pulley would work was either burned at the stake or put in prison for life on account of communication with the Evil One. This objection to profits arises from the human weaknesses known as envy, malice and hatred. That is my conclusion. I shall be asked, "What about the Trusts?" I venture to say no such thing as a Trust ever existed. No business man that I know of has as yet been able to discover the thing which we mean when we speak of a Trust. The nearest approach to a Trust which has yet been developed is undoubtedly the Labour Movement as we know it to-day. When you get an artisan class organised one hundred per cent., and able to dictate absolutely the terms upon which they will perform their service, that is as near as we have ever yet attained to a Trust. But it is not a Trust; it exists, like the whole Capitalistic System, upon public opinion. Those men are only able to extort those terms because public opinion as a whole accepts them, and the moment public opinion takes the view that those terms are not to be allowed, then the men themselves will come out of the Trust, or if they won't another set of men will take their places.

* Address delivered before the Industrial League and Council at Caxton Hall, Westminster, on Wednesday, October 5, 1921.

Chemical Industry Society's Annual Dinner

Lessons from the Canadian Visit

At the annual dinner of the Society of Chemical Industry, on Friday, October 7, in London, references were made to the recent visit to Canada and the United States, and to several points in which British chemical policy might benefit from American experience.

SIR WILLIAM POPE, F.R.S., presided at the annual dinner, at the Connaught Rooms, Kingsway, London, on Friday, October 7. Among those present were Sir F. L. Nathan, Sir Robert Robertson, Sir Frank Heath, Engineer Vice-Admiral Sir George Goodwin, Capt. H. Riall Sankey, Sir Joseph Petavel, Prof. J. S. S. Brame, Sir William Tilden, F.R.S., Mr. Chaston Chapman, F.R.S., Dr. M. O. Forster, Mr. W. J. U. Woolcock, M.P., and others.

Professor H. E. Armstrong

The first toast was that of "The Society," coupled with the name of Sir William Pope, which was proposed by Prof. H. E. Armstrong. Referring to the visit of the Society to Canada, PROFESSOR ARMSTRONG said that those who had gone out had come back with a message of goodwill and an expression of a desire that British and Canadian chemists should be more firmly knit together. He thought it only appropriate that they should send a reciprocal message to the Canadian chemists. In taking this step they must all realise that Canada was the country of the future for chemists, and they must look forward to the translation of a very considerable proportion of chemical industry to that region at no very distant date. They had to recognise that Great Britain carried double the population that it ought to carry, and the sooner a good many of them got out of it the better. He suggested that a number of the younger chemists in this country should get together and go out to Canada, spending six months, first of all, getting some honest training. Then they should settle down somewhere near some big fall, perhaps build a water-wheel, and then set to work to show that they knew something of chemistry, and could make use of it. There was a real opportunity in Canada for real chemistry, and if such a body of pilgrims went out there it might be the beginning of a new era for the chemical industry in our Empire.

In consequence of the visit of the Society to Canada this year, a new responsibility had been cast upon them. The Society was no longer a local Society. It had done what he believed no other society in the country had done: it had gone abroad, and it must, therefore, develop a policy. He did not believe the Society would ever be a success until it made its centre of gravity Lancashire, and not London. They had never brought any weight into their counsels, and never would do in London, and they must get to the centre of things if they were going to be a real success and make themselves felt. The motto of the chemical industry in this country must be efficiency before all things.

Dr. Fierz had communicated a very remarkable paper to the British Association, and seemed to have learned a thing or two about the conditions in the chemical industry at the present time, and he had pointed out that there would not be 5 per cent. in the dyestuff industry in the future. There was going to be a tremendous amount of competition in the future, and the only thing for us to do was to attempt to do a few things very well indeed, so that nobody else could follow, and it was in that way that the policy of efficiency and intelligence must come in much more than it had done in the past. So far, too much had been attempted.

Science and Warfare

He felt that a word ought to be said on an occasion like that with reference to some of the remarks that had been made respecting Sir William Pope at Edinburgh. Exception had been taken to the views he had expressed that poison-gas warfare was the most humane form of warfare. He did not think they need discuss that now; his opinion was that it had gone by when science could have anything whatever to do with sentiment. Their duty was to develop science to the utmost, without fear of the consequences. It had not been the custom of the Society to recognise his (Prof. Armstrong's) work in any direct way, but indirectly it had paid him that day one of the greatest compliments possible, and one which he valued above any other that could have been paid him—namely, in allowing him to propose this toast and couple it with the name of Sir William Pope, because if he had made no other contribution to the chemical industry than that of Sir William Pope he would be well satisfied with his work. Sir William had played a very important part as the plenipotentiary of the Society, and from all one had heard they could not have had a better representative. He ventured to claim in Sir William Pope proof of the success of his own system of education—namely, the policy of letting alone as much as possible. At the present time there was too much over-feeding in the educational sense; but in Sir William Pope he claimed an illustration of the success of the system which he himself had always advocated. The result was that Sir William Pope never swore, never referred to colloids, or even to the concentration of hydrogen ions; he was free from all the bad language of the day, and spoke in honest English, which everyone understood (laughter).

Sir William Pope

SIR WILLIAM POPE said it was a difficult task to reply to one's health when it was proposed by a former chief. So far as the visit to Canada was concerned, he had always recognised before he went there this summer that the Canadian Sections of the Society were an immense asset; but since going there he was perfectly convinced that the five Canadian Sections were of such enormous value to the Society that they ought to cultivate in every possible way the relationships which had now been set up so intimately between us. It was perfectly clear that the Canadian members wished for nothing more than to be allowed to join hands with us in this country, and to work together in the interests of the Society, which meant, of course, to work together in the interests of the chemical industry of the Empire. Another outstanding feature of the visit to Canada was the manner in which the annual meeting there was made the object of a real British demonstration on behalf of chemistry, as opposed to the German chemical interests in Canada. Indeed, that was the case when they were both in Canada and in the United States, the opportunity being almost taken to push on one side the German element, which, naturally, was extremely strong there. When they passed from Canada into the United States there was a kind of rivalry between Canada and the States as to which should treat them most hospitably.

Lessons from America

The New York Section of the Society was obviously very powerful, even in the headquarters of the great American Chemical Society. There was evidence on all hands that the members of the Society of Chemical Industry in America desired to live in harmony with the members of the American Chemical Society, and seeing that the American Chemical Society recognised that it had a valuable ally in the New York Section of the Society of Chemical Industry, it was the duty of all of them to endeavour to increase the scope of the New York Section as much as possible. The American Chemical Society numbered 17,000 members, and was practically the only chemical organisation in America. Thus, instead of having, as we had in this country, a large number of chemical societies and chemical organisations, a few of them large and powerful, others small, but still influential, each absorbing money, and running up expenses uselessly, the Americans had contrived to pour everything into one pot, with the result that the American Chemical Society was now the most powerful, the most wealthy and the most influential chemical organisation in the world. If it continued to progress in the way that it had during the last ten years, it would practically swamp every other society in the world, simply by reason of its financial resources. That ought to be a very great object-lesson to us in this country, where we should group together our financial resources and develop the things that were required to be developed much more upon the co-operative system than had been the case in the past.

By reason of its magnitude, the American Chemical Society had acquired very considerable influence in the United States Legislature, and no legislation connected with the chemical industry or with chemical science had any chance of passing into law without the co-operation of the American Chemical Society. Contrast that position with what we had here. All sorts of different bodies pretended to speak on behalf of chemistry, and the Government naturally pitted one against the other, and in the end did exactly what it pleased. The result was the utmost confusion. An instance of that was the Key Industries Bill. If that had come forward in the United States it would have been dealt with in an entirely different manner through the one great chemical organisation there. It was only by coming together for the common good that there was any prospect of doing more than had been possible in the past, as had been done by the American Chemical Society. For instance, the publication system of the American Chemical Society was an entirely admirable scheme, and when it got properly working it would carry enormous influence in the chemical affairs of the world. Thus, a second object-lesson which they had learned across the water was the necessity, if chemists were to keep their heads above water, for closer co-operation, and the sinking of their own differences for the common good.

The New President

With regard to their new President, Dr. Ruttan, he had for long recognised him as an extremely able man, and a very level-headed man of business, but when they were in Canada it became obvious that he was the one man who was leading chemical matters in the Dominion. Dr. Ruttan was closely in touch with the legislation now in progress in Canada concerning chemical research, and, in fact, scientific research in general. He was, amongst scientific people, the one man, probably, who was interesting himself in the public side of chemical science, and he could not conceive of any happier choice at the present time of a President for the Society of Chemical Industry. Therefore, he thought the suggestion which Professor Armstrong had made, of sending a message to him, was an excellent one. It was a suggestion which was so obvious that it really ought to have come from one of the officials of the Society; but he hoped those present would allow them to send to Dr. Ruttan a cable wishing him prosperity during his year of office as President, and hoping that he would maintain the dignity of chemistry in Canada in the future, as he had done in the past.

Dr. E. V. Evans

Dr. E. V. EVANS, in proposing "The Visitors," said that the chemical industry at the present moment was in by no means as flourishing a state as could be wished; but luckily, there was a definite sign of better business coming along in the future, and it could only be hoped that we had passed the lowest point in the curve of chemical commerce. There was one matter upon which they could pride themselves, and that was that they had at last brought the Government and intelligent people—among whom he included Members of Parliament—to realise that this country must have a chemical industry—perhaps he ought to say an organic chemical industry, because we already had an inorganic chemical industry of considerable magnitude—if we were to maintain our safety in the future. That was proved by the passing of the Dyestuffs Act, which was not a measure that offered protection in the old political interpretation, otherwise he would not dare to bring the matter before them. It was, however, protection for the organic chemical industry, which at that time was at a most vital stage in its development. He did not think there were many of them who appreciated that the dye industry, after all, had done something. There was a general impression that the dye industry was a weakling fed on Parliamentary glaxo—(laughter)—and that it would never have a possible chance of arriving at manhood. He could assure them, however, that the dye industry was really a sturdy youngster. It had suffered from many set-backs.

The British Dyestuffs Industry

They would all remember the Proclamation by which dyes were prohibited, but Justice Sankey ruled that out. Following that, dyestuffs were literally thrown into this country, and at that time the dye industry had to contend with German competition, with thirty or forty years' experience behind it, with all the capital on the plant repaid, and the depreciated value of the mark. Up to that point, however, the dye industry had done something, although there was a great deal more to be done. There were questions of shade, continuity of output, efficiency, and price. All these were of the utmost importance, yet the dye industry had made considerable progress up to the time of the Sankey decision. In 1913 we brought into this country dyes to the value of £20,000, and ourselves made dyes to the value of £2,000. In 1920, however, these figures were just reversed, and we made to the value of £20,000 and imported to the value of £2,500.

There was every indication that chemists would be up against a bigger problem in the next year or two than they had ever had to face before, and in this work they would require the help of the allied sciences which were represented at the dinner that evening. Soon after the Armistice he went over the Rhineland factories, and what struck him more than anything else was the manner in which the applied chemist in Germany was catered for in everything appertaining to engineering. Whether he required alkali or acid-resisting metal work, special pottery or porcelain, it was all available, and in addition, there was real sympathy between the chemist and the engineer. The chemist in the future would particularly require the help of physics, mechanics, metallurgy, and so on, and it was because chemists recognised this that they had paid honour to the representatives of those other branches of science who were their guests that evening. He coupled with the toast the names of Vice-Admiral Sir George Goodwin (President of the Institute of Metals), and Sir Frank Heath (Secretary to the Department of Scientific and Industrial Research).

Sir G. Goodwin and Sir F. Heath

Engineer Vice-Admiral Sir GEORGE GOODWIN, who first replied to the toast, said that the activities of the Society of Chemical Industry touched those of almost every other industry in existence, and he himself had had many occasions, in the Engineering Department of the Fleet, to avail himself of the service of chemists in assisting the Department to get over many of the difficulties which often arose.

Sir FRANK HEATH said that it was quite obvious that many of the schemes which had been brought forward after the war, such as housing, education, &c., might have to be dropped, not because they were bad in themselves, but because of the conditions which the war had brought into existence. There would have to be sacrifices, both individually and collectively, in the very near future, but whatever those sacrifices might be, we ought to do all we could to see that we would not be called upon as a nation to lose more than was absolutely necessary of the means we at present possessed for adding to new knowledge. After all, when the immediate difficulties between capital and labour, and of the exchanges, were removed, and the wheels again began to turn, we should even then not have reached the fundamental conditions to which, in the long run, this country must look for removing its present excessive liabilities, and for regaining its premier position in the world. That could only be done by being ahead, as we were at the beginning of last century, of the rest of the world in our means of production, and he thought they would agree with him that certainly the principal means, if not the only means, to which we could hopefully look for this new development was science. If the interests such as those represented by the Society of Chemical Industry would only unite forces, if they could only unite the forces of scientific thought with the forces of scientific manufacture, and at the same time educate the public, there was very little danger in the long run that we should be asked to make excessive sacrifices in our means of adding to knowledge. That, perhaps, was an indication of the difficulties ahead, but an organised public opinion could only be obtained by the work of such bodies as the Society of Chemical Industry.

Reduction in Duroglass Prices

DUROGLASS, LTD., 40-43, Norfolk Street, Strand, W.C. 2, the well-known makers of British scientific glassware, announce in anticipation of the increased demand for such glassware in consequence of the Safeguarding of Industries Act, that from October 1, 1921, their prices for all types of Hollow-ware will be reduced by an average of 15 per cent. Mr. Chaumeton, the sales manager, will be glad to supply detailed quotations on application.

The Disposal of Waste Liquors

By Edward Ardern, D.Sc., F.I.C.

At the opening meeting of the 1921-22 Session of the Manchester Section of the Society of Chemical Industry the Chairman delivered his opening address, taking as his subject "The Disposal of Waste Liquors."

Dr. ARDERN said that it was quite impossible to deal specifically and adequately with the treatment and purification of trade-waste in the course of a short address; moreover, the ground had been quite well covered by recognised text-books, of which special mention might be made of that by Maclean Wilson and Calvert. It was, therefore, his intention to treat the subject in a brief and general manner, with the idea of more or less defining the position of the manufacturer in relation to (*a*) the question of rivers pollution, and (*b*) to local authorities. The subject thus fell naturally into two divisions, viz.:—

1. Where waste liquors are discharged into natural watercourses, and
2. Where waste liquors enter sewage systems.

Discharge into Natural Watercourses

At present control over the character of waste liquors discharged into watercourses was effected by: (*a*) action at common law by riparian owners below stream, and (*b*) action by the district sanitary authority, which might be the local authority, the county authority, or certain joint rivers boards which had control over rivers and streams in particular watersheddings, and which had authority to take proceedings under the Rivers Pollution Prevention Acts or certain special Acts.

Naturally, control under (*a*) was most variable, and was entirely dependent on infringement of water rights held by riparian owners below stream, so that actual damage of the watercourse must have taken place sufficient for it to be established beyond doubt that the riparian owner in question had been prejudiced before action might be taken successfully.

In comparing the nature of control effected by riparian owners and sanitary authorities several differences were exhibited. A riparian owner would have ground for action where the discharge above stream of waste liquor into a watercourse had given rise to one or more of the following effects, viz.: (1) Material increase in the hardness of the stream water; (2) Appreciable increase in the amount of iron in solution, and (3) The presence of colouring matter; any one of which results might very possibly prejudicially affect the riparian owner in the course of his manufacturing processes, whereas it was extremely problematical whether the sanitary authority would be allowed to take proceedings on any of these grounds. On the other hand, sanitary authorities were not impeded by any question of prescriptive right, as such claim would be no defence against proceedings taken under the Rivers Pollution Acts.

Dealing with the question of what constituted a polluting liquor, Dr. Ardern said there was no legal definition, and, moreover, all authorities were agreed as to the extreme difficulty of fixing any chemical standard which could be applied equitably to all classes of industrial waste, especially having regard to the means of their purification. In fact, one might go further and say that most authorities were agreed that if not impracticable it was certainly undesirable to establish a definite legal standard.

While certain broad principles might be applied to the consideration of what should not be allowed in waste liquors discharging into natural watercourses, such as excessive suspended matter, highly putrescible matter, material acidity or causticity, sulphides or other readily oxidisable compounds, free chlorine or other sterilising agents, the writer was in agreement with the view generally accepted, and more or less recommended by the Royal Commission on Sewage Disposal, namely, that this question of pollution was best determined by the ascertained effect on the character of the watercourse itself.

Having further dealt with the details incident to this point of view, Dr. Ardern stated he had no hesitation in saying that the time was long overdue when effect should be given to the recommendation of the Royal Commission on Sewage Disposal with respect to the formation of additional rivers boards and the establishment of a central rivers authority to co-ordinate, encourage and assist in various ways the operation of such boards. The establishment of such an authority on right lines should ensure more uniform treatment of manufacturers throughout the country in respect of the character of waste liquors discharged, and at the same time effect a general improvement in the character of watercourses in industrial areas. In Dr. Ardern's opinion there was plenty of room for improvement in this respect, without affecting materially the interest of the chemical industry as a whole.

Manufacturers' Trade Waste

Dr. Ardern then proceeded to discuss the question of the admittance of manufacturers' trade waste into public sewers from the point of view of section 7 of the Rivers Pollution Prevention Act, 1876, sections 16 and 17 of the Public Health Acts (Amendment) Act, 1890, and sections 15 and 21 of the Public Health Act, 1875.

It had been held, as the result of a Local Government Board inquiry in June, 1898, that there was no obligation on the local authority to provide sewers large enough to accommodate manufacturers' trade waste. Further, it had been held by the Court of Appeal in *Brook v. Meltham U.D.C.* (1908, 2 K.B. 780) that section 21 of the Public Health Act, 1875, did not give manufacturers right of access to the sewers of the local authority.

In addition to the foregoing general Acts of Parliament, many local authorities had obtained private Acts conferring upon them special powers with regard to the reception of trade waste into their sewers. Briefly, these special powers included provisions for

(*a*) Power to require preliminary treatment whereby trade effluents should comply with certain regulations embodied in a common-law agreement between the authority and the manufacturer, *e.g.*, Manchester Corporation (General Powers) Act, 1902; and

(*b*) Power to levy special charge on manufacturers, additional to the ordinary sewerage and sewage disposal rate of the district, for which of course they were liable, with or without preliminary treatment of the waste liquor prior to discharge into the sewers, *e.g.*, Halifax Corporation Act, 1905, Part II; Huddersfield Corporation Act, 1906, Part II.

Dr. Ardern then quoted from the recommendations of the Royal Commission on Sewage Disposal with respect to manufacturers' waste liquor (Third Report 1903) and stated that effect had not yet been given to those recommendations. The general Acts of Parliament did not define very clearly the position of the manufacturer in relation to the local authority, and consequently there was a decided lack of uniformity in the treatment of manufacturers throughout the country with reference to the disposal of their waste liquor by discharge into public sewers, having regard to the various private Acts enforced by certain local authorities. In certain instances, manufacturers' trade waste, especially in the case of old connexions, was admitted to sewers without any control whatever and without any special charge; in other cases, preliminary treatment was required without special charges, while in several districts the manufacturer was charged varying amounts for the privilege of discharging waste liquor into the sewers, either with or without preliminary treatment. In special cases manufacturers had been called upon to bear part of the capital expenditure on sewage-purification works of the local authority as well as an annual charge, additional to the ordinary sewerage and sewage disposal rate levied throughout the district.

Dr. Ardern's Suggestions

As the result of a fairly extensive experience, the writer offered the following suggestions with the view of affording an equitable settlement of the important question of the relative responsibilities of the local authorities and manufacturers, which, it would be seen, in general followed on the lines recommended by the Royal Commission on Sewage Disposal:—

(1) That, subject to certain reservations, it is the duty of the local authority to accept responsibility for the admission of trade effluents into their sewers.

(2) That all trade effluents should conform to standard regulations framed by the local authority and confirmed by a joint committee of the local authority and manufacturers in the district, or, failing agreement, by reference to a central authority.

(3) That there shall be no differential treatment as between manufacturers already discharging waste liquors into the sewers and those applying for new connexions.

(4) That the local authority shall be empowered to make a special charge (agreed upon as under (2)) where the character and/or volume of waste liquor is such, even after compliance with the general regulations, as so to affect the nature of the total sewage flow of the district as to increase materially the cost of its purification.

Dr. Ardern was of opinion that the local authority should have power to prohibit, without recourse to complicated legal machinery, the discharge of waste liquors into sewers where they might (*a*) give rise, either alone or in combination with the sewage itself, to conditions dangerous to the life or health of workmen engaged in the sewers ; (*b*) create serious nuisance ; or (*c*) so alter the character of the sewage as to disorganise any practicable type of sewage purification plant. In view of actual experience in the past, he considered these points to be of the first importance.

Naturally there was considerable difference of opinion on the question of special charges for the reception of trade waste into public sewers. Inasmuch as the admission to the sewers of by far the majority of trade wastes, even after preliminary treatment, must increase in varying degrees the ultimate cost of the purification of the sewage, the general ratepayer naturally held the view that such increase in cost should be borne by the manufacturer as a legitimate trading charge. On the other hand, the local authority must have regard to the advantages accruing to their district by the establishment of industries in which the production of waste liquor was unavoidable.

Only in certain cases should special charges be made for the reception of trade effluents into the sewers. If the proposed regulations were conceived in a reasonable spirit the majority, at any rate, of manufacturers would appreciate fully their responsibility in the matter. Provision should be made, however, for guarding against inadequate control of any preliminary purification plant, and penalties should be imposed for wilful neglect of such plant. Briefly, the general regulations referred to would, of course, include provision against effluents of the character which it was held should be prohibited from sewers, and also with regard to (*a*) equalisation of flow, (*b*) limit of temperature, (*c*) limit of amount of suspended solids, and (*d*) acidity.

Regulations framed on these lines would permit of effluents containing dye liquors or heavily charged with oxidisable matter of varying character, and it was in respect of the amount and character of such matters that the question of special charge would arise.

Conclusion

It was apparent that a satisfactory solution of this vexed problem called for the hearty co-operation of both local authorities and manufacturers, between whom it was of the utmost importance that amicable relations should be established. Manufacturers, in their own interests, should give more serious consideration than was usually given to the subject under review. The disposal of waste liquor should be definitely treated as an integral portion of any manufacturing problem, if not equally important with such matters as water supply or transport facilities. While it would be foolish to suggest that in the majority of cases actual profit might be anticipated from a closer attention to the character of the waste liquors discharged from any manufacturing process, it was well known that there were numerous instances where this had proved to be the case. Moreover, it was seriously contended that a closer study of the nature of the resultant waste liquor would assist materially in the more efficient control of the manufacturing process itself.

On the motion of Mr. John Allan, seconded by Mr. J. Hannay, a vote of thanks was passed to Dr. Ardern for his address.

Chemical Industry Club

Committee's Report for the Past Year

IN their third annual report the committee of the Chemical Industry Club state that the year has been a very difficult one in the chemical as in nearly every other industry in the country, and this has been reflected to a certain extent in the affairs of the club, though not so seriously as was feared. There have been many changes. Some members have moved from London permanently, others have gone abroad ; and owing to the unsettled conditions fewer candidates have offered themselves for election than would otherwise have been the case.

The report records with regret the death of six members. The number of members at September 1, 1920 was 715 ; joined during the year, 104 ; died and resigned, 62, leaving the present total at 757. In addition to the number who have resigned, however, no fewer than 67 members cannot be traced. Although it is hoped the majority of these will communicate with the hon. secretary, to give a correct statement of the membership this number must for the moment be regarded as off the active list, which brings the total number down to 690, or 25 fewer than last year. Notwithstanding this reduction in numbers, it will be satisfactory to members to know that the club has paid its way and that the balance in hand has been maintained.

The policy of the committee during the past year has been influenced to some extent by the depressed condition of trade. It was felt that the time was not ripe for extended efforts to make the club better known, but it is hoped that during the coming winter it may be possible to do more in this direction. The club can accommodate many more members, and the larger the number the more facilities the committee will be able to offer. Members are again urged to do their utmost to introduce fresh candidates. The monthly meetings during last winter were well attended, and an attractive programme has been arranged for this winter.

The committee regret to report that owing to pressure of other work Captain Harvey, who has filled the position of assistant secretary during the past eighteen months, has been obliged to resign. It has been decided not to appoint another paid assistant secretary. Mr. W. Cullen has kindly offered to assist Mr. H. E. Coley in the duties of secretary as assistant hon. secretary, and this arrangement the committee feel sure will not only benefit the club but reduce expenditure.

During the year there have been some changes in committee. Mr. Aldrick for reasons of health had to resign, and Mr. Bernard F. Davis, who has been a prominent member of committee and of the club since its inception, is also resigning, as he is going abroad. Mr. Brewis also finds himself obliged to resign. These gentlemen have done much for the club, and their absence from the committee will be much felt. The thanks of all are due to them for their valuable help and work. The retiring members of the committee are Messrs. Craig, Dehn, Ormandy and Pilcher, all of whom offer themselves for re-election.

During the year the club has opened its doors for committee meetings of various scientific societies, such as the London Section of the Society of Chemical Industry, the Chemical Engineering Group of the same Society, the Society of Public Analysts and the Radium Lodge. The committee would be glad to welcome other allied societies should they require similar facilities.

The number taking meals at the club during the year has considerably increased, as well as the number of those who have made use of bedroom accommodation. Country members may now rely upon better facilities than prevailed during and immediately after the war. The committee desire to thank most heartily all those who have contributed during the year to the success of the club.

The annual general meeting of the club has been fixed for Monday next, October 17, and the third annual dinner for Friday, November 18, at the Connaught Rooms.

The Sir Clement Royds Memorial Scholarship in Chemistry in the University of Manchester has been awarded to MR. J. F. WILKINSON, B.Sc., who will undertake research work in organic chemistry. This scholarship is now awarded for the first time, having been founded in 1920 by the munificence of Lady Royds in memory of her late husband.

September Trade Returns

Encouraging Increase in Exports

IN spite of the pessimistic opinions which are held in some quarters, the Board of Trade Returns for September show that our exports are slowly and steadily beginning to increase. Taking September of last year as about the end of the period of abnormally inflated values, we find, with the exception of November, a steady decline in exports from £130,000,000 in September, 1920, to £45,000,000 in June last. Since June there has been a steady increase each month, the totals being £52,000,000 in July; £61,000,000 in August; and nearly £64,000,000 in the month under review. Although these increases are not exactly epoch-making, it must be remembered that once the machinery of trade becomes clogged it requires a longer time to set it in motion than most people are apt to think. Again, it is obviously unfair to compare the figures for September, 1921, with those of the corresponding month last year as values have declined considerably since then. Taking a more recent comparison which reflects something like current conditions the August and September figures are :—

	Imports.	Exports.	Re-Exports.
August	£88,581,040	£51,346,307	£9,997,779
September ...	87,118,507	55,247,578	8,594,644
	−1,462,533	+3,901,271	−1,403,135

Comparing the figures for the nine months of the current year with similar figures for 1913, the last pre-war year, we find that imports are up £269,911,771, exports £127,899,410, and re-exports down £4,724,472, making the increase in exports £123,174,938.

Chemicals and Drugs

The month's figures show a general increase in imports of chemicals chief among which were sodium nitrate, calcium carbide, potassium nitrate, distilled glycerine, bleaching materials and acetic acid. Detailed figures of the increases are given below with the August figures in parentheses, the amounts being in cwts. unless otherwise stated: Acetic acid, 422 tons (180); tartaric acid, 3,882 (2,463); bleaching materials, 5,981 (2,491); calcium carbide, 66,825 (38,663); distilled glycerine, 511 (190); red lead, 3,832 (2,218); nickel oxide, 2,136 (2,080); potassium nitrate, 16,004 (9,883); sodium nitrate 57,412 (19,197); and sodium compounds, other than nitrate, 15,276 (11,722). The decreases, similarly compared, are: Borax, 1,380 (1,645); crude glycerine, 309 (1,004); cream of tartar, 2,251 (3,454); and zinc oxide, 474 tons (509).

Further Recovery in Sodium Compounds

The increase in the export of sodium compounds recorded last month is nearly doubled again in September. On the other hand the exports of tar oil, creosote, &c., have decreased by about two-thirds. The following figures show in detail the products which show increases over the August exports, the figures for the latter being in parentheses. The amounts are in cwts. unless otherwise stated: Ammonia chloride (muriate), 294 tons (156); sulphate of ammonia, 12,262 tons (7,549); benzol and toluol, 2,192 galls. (nil); carbolic acid, 5,160 (4,715); naphtha, 7,101 galls. (1,435); naphthalene, 3,594 (970); potassium chromate and bichromate, 915 (332); potassium nitrate, British prepared, 1,076 (821); sodium carbonate, 325,169 (163,450); caustic soda, 55,991 (26,715); and sodium compounds not elsewhere specified, 60,468 (37,735). The following show decreases: Sulphuric acid, 1,497 (2,723); tartaric acid, 565 (581); bleaching powder, 6,092 (8,216); tar oil, creosote, &c., 72,363 galls. (3,275,794); coal tar products not elsewhere specified, 18,128 (20,317); distilled glycerine, 514 (2,088); sulphate of copper, 187 tons (191); sodium chromate and bichromate, 2,320 (3,475); sodium sulphate, including salt cake, 17,089 (20,111); and zinc oxide, 30 tons (122).

Dyes and Dyestuffs

There is a general decrease in imports of dyes and dyestuffs, the only increases, very slight, being represented by synthetic and natural indigo; no intermediates were imported during the month as in August. The total imports of dyes and dyestuffs for the month were 796 cwt. as against 5,527 cwt. in the previous month. Compared with August the decreases are as follows: Alizarine 31 cwt (4,162); and coal tar dyestuffs other than alizarine and synthetic indigo 763 cwt. (1,365). Under extracts for dyeing, cutch is 2,093 cwt. against 2,100. Imports of painters' colours and materials all show increases, the comparative figures being: Barytes, ground, 32,891 cwt. (28,714); white lead (basic carbonate), 4,344 cwt. (2,705); and painters' colours, &c., other sorts, 46,468 cwt. (32,408).

Exports of painters' colours are also up, the total being 76,995 cwt., as compared with 73,073 cwt. While no detailed figures are supplied in connexion with exports of dyes and dyestuffs the figures show that coal tar dyes were exported to the extent of 4,957 cwt. as against 4,098 in August; while other sorts are given at 4,343 cwt., as compared with 5,637.

Scientific Glassware

Scientific, illuminating, optical, &c., glassware was imported to the extent of 35,633 cwt. valued at £121,527, as against 32,956 cwt. to the value of £135,436 imported in August. Exports under this heading amounted to 1,835 cwt., of the value of £33,874; the previous month's total was 1,747 cwt., valued at £30,794. It will be seen from these figures that while we paid more for our imports during the month, we received less for a larger quantity of glassware exported, but as no discrimination is made in the returns as to the class of glassware it would be unwise to attach much significance to this.

During September, 3,406,579 tons of coal, valued at £5,194,356 were exported; the exports for the preceding months of the year were as follows: August 3,103,207; July, 816,320; June, 7,502; May, 14,066; April, 606,548; March, 1,968,078; February, 1,729,148; and January, 1,700,106.

Commercial Vehicles at Olympia

Big Display of Lorries and Tipping Wagons

ORGANISED by the Society of Motor Manufacturers and Traders, the Fifth International Commercial Motor Exhibition opened at Olympia on Friday and will remain open until October 22. Congresses will be held during the period of the exhibition, and among the many matters down for discussion are those relating to loading devices for commercial vehicles; the evolution of the motor vehicle for goods and passenger service; and coke as a fuel for commercial vehicles.

In the chemical and allied industries mechanical road transport has many advantages over the railways. Generally speaking, it is as speedy as the railway and it obviates constant loading and unloading and the holding up at various stages between the consignor and the consignee. While vehicles of all kinds are shown, lorries with tipping and other devices will be of the greatest interest to chemical manufacturers. Among the tipping wagons exhibited is the "Star" 50-cwt. tipping wagon, made by the Star Engineering Co., Ltd., of Frederick Street, Wolverhampton, and which is supplied with a 20/25-H.P. water-cooled engine. It has a wheel base of 10 ft. 6 in. to enable the lorry to be weighed on a standard weighing machine, and has four speeds forward and one reverse. The sides, which are bolted down to the bottom framework, are 18 in. high and the carrying capacity is 8 ft. 9 in. long by 5 ft. 7 in. wide. The vehicle is painted dove grey and is highly varnished.

Newton Brothers (Derby), Ltd., are showing a "Newton Derby Electric" chassis, steel body and cab. The body capacity is up to 2½ tons of average refuse and is of the end-tipping type, operated by an electric motor, the switchgear being of a type which, the makers claim, absolutely precludes over-tipping. Power transmission is from two slow-speed traction-type motors suspended by a special method. The body presents an extremely low loading line, being only 4 ft. 6 in. above the road level and, in many cases, only about 3 ft. 4 in. above the level of the pavement. The control gear is easy of access and is, it is said, readily manipulated by the untutored.

A feature of the exhibit of Commercial Cars, Ltd., of Luton, is a 4-ton three-way tipping wagon which will tip either side and also endways. The body is tipped by hydraulic rams to an angle of 40 deg. in a short space of time. The chassis is of the chain-drive R.C. type and is fitted with a 32-H.P. engine. The firm also shows a new 40-H.P. 5-ton "Commer" chassis which is built to carry a 5-ton net load in addition to body and equipment of 1 ton.

A three-way "Vulcan" tipping wagon shown by the Vulcan Motor & Engineering Co., Ltd., of Lord Street,

Southport, is mounted on a 20-H.P. 2-ton chassis fitted with a patent twin-ram three-way hydraulic tipping gear, which tilts the body on either the near of off side, and also at the end, to an angle of 40 degrees.

The "Waytip" lorry, manufactured by W. & G. du Cros, Ltd., is an adaptation of their 2-ton lorry, and is fitted with two separate compartments of 1-ton capacity, each of which can be weighed on the chassis and tipped independently on either side of the vehicle.

An interesting item at the stand of John J. Thornycroft & Co., Ltd., of 10, Grosvenor Place, S.W.1, is a model of the 40-H.P. Thornycroft War Department lorry of which 5,000 were supplied to the Government for war service. They also show 2-ton and other types of Thornycroft vehicles.

Two 3½-ton 35-H.P. six-cylinder "Halley" chassis are shown by Halley's Industrial Motors, Ltd., of Yoker, Glasgow, who also exhibit a 45-H.P. 6-ton chassis. The two former have a 13 ft. 4 in. wheelbase, while the width of the latter is 15 ft. 6 in.

Among other exhibitors of commercial vehicles may be mentioned: The Albion Motor Car Co., Ltd.; The Associated Equipment Co., Ltd.; Austin Motor Co., Ltd.; Clayton Wagons, Ltd.; Daimler Co., Ltd.; Dennis Brothers, Ltd.; Fodens, Ltd.; Guy Motors, Ltd.; Karrier Motors, Ltd.; Leyland Motors, Ltd.; Mann's Patent Steam Cart & Wagon Co., Ltd.; Maudslay Motor Co., Ltd.; Sentinel Wagon Works (1920), Ltd.; and Straker Squire, Ltd.

Accessories and Components

Ferodo, Ltd., of Chapel-en-le-Frith, are exhibiting specimens of Ferodo friction linings which, the firm state, were used on all Government transport as well as on the brakes and clutches of the tanks of our own and allied armies throughout the war. An interesting feature of this exhibit is a clutch lining which is said to have been in daily use on a London motor bus and which shows very little signs of wear after running 35,000 miles.

"National" benzole and the "N.B.C." lubricating oils are shown in various stages of production at the stand of the National Benzole Co., Ltd., of 30, Grosvenor Gardens, S.W.1. The lubricating oils have been specially prepared for use with benzole on mixtures of benzole and petrol. Other exhibitors in the accessory and component section include: Allen-Liversidge, Ltd.; "All's-Well" Oil Co., Ltd.; Anglo-American Oil Co., Ltd.; Brampton Brothers, Ltd.; British Petroleum Co., Ltd.; Carbic, Ltd.; Hoyt Metal Co. of Great Britain, Ltd.; and Jenson & Nicholson, Ltd.

Chemical Motion Pictures

To the Editor of THE CHEMICAL AGE.

SIR,—We notice in the current issue of THE CHEMICAL AGE in your comments on the New York Chemical Exposition, a reference to the motion picture illustrating the working of the sulphur mines of the Texas Gulf Sulphur Co. We are the sole agents of this company for the United Kingdom, and we have recently received a copy of the film in question, which was taken under the direction of the United States Department of Interior, Bureau of Mines.

We understand that the picture has been in great demand in America by technical associations and meetings, and we write to say that we would be only too pleased to loan the film for showing purposes to any interested society or institution, on application to us.—Yours, etc., CHANCE & HUNT, LTD.

61-62, Gracechurch Street, E.C.3., Oct. 12.

Education of Soapworkers

A NEW series of University Extension lectures has been inaugurated at Port Sunlight, where Mr. S. Dumbell, B.A., is giving twenty lectures on economics. The directors of Lever Brothers, Ltd., have offered to refund the education fees to all students taking recognised courses of study who make 80 per cent. of the possible attendances at their classes and sit for the usual examinations. In addition a series of book prizes are offered, ranging in value from £5 to £2, for those who pass in matriculation, intermediate, or final examinations for degrees. For local commercial and other classes prizes are also offered, ranging from smaller values for elementary passes to 35s. for "advanced" first class. These facilities apply to all employees at Port Sunlight, Royal Liver Building, Liverpool, and branch offices of Lever Brothers.

Affairs of a Paint Manufacturer

THE first meeting of creditors under a receiving order made against Robert D. Stewart, paint, varnish and colour manufacturer and merchant, 12, Marshgate Lane, Stratford, on September 23, was held on October 5 at the London Bankruptcy Court. The proceedings were on the petition of the Produce Brokers Co., Ltd. The debtor, in a preliminary examination, had stated that he had carried on business as above for 38 years, first at 61, Mansell Street, Aldgate, and recently at 12, Marshgate Lane, Stratford. He started business with £1,500 capital, and for the greater part of his time had traded with success. But he suffered heavily during a slump in turpentine before the war, which involved him in a loss of £7,000, and from this he had never recovered. No statement of affairs had been filed, but the debtor estimated his unsecured liabilities at £13,885, due to about 100 creditors. The assets included cash at bankers £250, stock-in-trade estimated to produce £500, machinery, fittings, &c., £500; furniture £125, book debts £1,006, estimated to realise £906, and the equity in a freehold house at Highgate £330. His failure was due to the heavy loss on turpentine, to interest on borrowed money, to the present trade slump and to ill-health. In answer to the Official Receiver, the debtor said he considered that the goodwill of his business was worth something like £10,000. Since the bankruptcy petition was filed, customers had been telephoning for goods, which, because of these proceedings, he could not supply, and he was afraid his connexion would disappear. If he were allowed to continue the business he believed he could do so with great benefit to his creditors. The Official Receiver pointed out that before this could be done a trustee in bankruptcy must be appointed, because at present nobody could give the debtor the necessary authority to carry on. The meeting was adjourned for a week, with a view to the appointment of a trustee.

Soap and Soap Solutions

LECTURING to the members of the Royal Philosophical Society of Glasgow, on October 5, Sir James Walker quoted a German chemist as saying that the quantity of soap consumed by a nation was a very good measure of the wealth and civilisation of that nation, a dictum with which he was sure Lord Leverhulme would cordially agree. In these modern times the statement might be accepted as approximately true. After a dissertation on the ingredients of soap with demonstrations of their chemical action, the lecturer said the problem of soap solutions had not been solved yet. The very commonest actions with which they were familiar sometimes presented almost insuperable difficulties in their scientific explanation. The action of soap in cleansing had been known for many hundreds of years, yet we did not quite know why soap should act as a cleansing agent in that way, and there was room for the students of all the universities in the kingdom to work on soap for many years before they would solve the problem thoroughly, even from the point of view of present-day science.

Mr. William Gillies, LL.D., the president, made sympathetic reference to the loss to the society by death since last meeting of Professor Edmund James Mills, sometime Professor of Technical Chemistry at Glasgow Technical College, well known to the older members of the society as an active worker and valued contributor of papers. He published a number of essays on chemistry, and also a volume of poems. He was probably the only member of the society who adopted Buddhism as his faith, and in that faith he died.

Tribute to Lord Moulton

SPEAKING at the annual general meeting of the Institution of Gas Engineers at the Central Hall, Westminster, on Tuesday, Mr. Thomas Goulden, the president, referred to the loss which the scientific community had sustained by the death of Lord Moulton. It was a great honour to their institution that Lord Moulton, at his advanced age, should have agreed to act as their president. That he did so was really because of the great assistance the gas industry rendered him in his capacity of Director-General of the Explosives Department at a time critical in the history of the State, because of the shortage of explosives. As a testimony of their grief at the loss of Lord Moulton, the members of the institution stood for a brief space of time in silence.

A New Artificial Ivory Process

Chemist's Claim Fails

A CHEMIST'S invention was the cause of an action in the Bow County Court on Monday, before Judge Graham, K.C. The plaintiff was Rudolph Green, of 17, Claremont Road, Forest Gate, chemist, and he sued Watkins, Hague & Co., Ltd., of 10, Lower John Street, W., chemical merchants, to recover £50, alleged to have been paid as salary to Mr. H. C. Bowen, of Woodhouse Road, East Ham, at the instigation of the defendants.

In opening the case it was stated that the plaintiff was an inventor, and he was asking for £50 wages paid to a Mr. Bowen from February to May, at £5 a week, at the request of the defendants. Side by side with this employment was an agreement by the defendants to purchase the invention of the plaintiff, making imitation ivory by a chemical process. That agreement was never carried out, as the defendants alleged that the plaintiff had no power to sell it, as the process had already been discovered by someone else. The defence was that they never authorised the employment of Bowen, an experimental chemist, but, if they did, it was only because they were induced to do so as they believed plaintiff to be an inventor of this artificial ivory, whereas it turned out to be untrue. Counsel said the plaintiff said he had invented a chemical process to convert horn, amber and analogous products into imitation ivory, whereas the defendants said the process had already been invented by a research chemist, Mr. Long, in whose employ the plaintiff was for some time, and it was alleged he got his information there, which, however, was denied, and Mr. Long would be called, and he would deny that the plaintiff's invention was an infringement of his. Long's invention was called "Nativol," and was made by a chemical process with compressed nuts, whereas, as had been stated, the plaintiff's was an entirely different process. The plaintiff took certain ingredients and made ivory, while Mr. Long took ivory waste, nuts, &c., and by means of air evaporation made ivory.

The plaintiff, giving evidence, said he was an experimental chemist. He invented this process and put it before the defendants, who entered into an agreement to buy it. Bowen was employed in his laboratory, and in February was threatening to leave, so he (plaintiff) asked defendants what he should do. Mr. Watkins agreed that it would be regrettable if Bowen left them at that time, and it was arranged he should be paid £5 a week, which plaintiff did for ten weeks. The defendants had never concluded the agreement to purchase, nor had they repaid the £50.

In cross-examination, plaintiff agreed that a new company was to be formed to run this, but it was really the defendants' firm. He did not know whether the other directors had confirmed the employment of Bowen or not. He denied that he was ever told that the defendants would not be responsible for the salary of Bowen until the agreement had been concluded for the purchase of the invention. He could not possibly carry on his chemical researches on behalf of the defendants unless they paid something.

Mr. Edgar Long, of 41, Gloucester Road, Regent's Park, said the plaintiff was with him for a time, and signed an agreement not to infringe his patent. He did not think this process was an infringement of his.

The defence was that Bowen had never been engaged by the defendants. A new company was to be formed to run this invention, but at the finish they all got nervous of it, as they feared that the plaintiff had no power to sell the process. All this appeared in the correspondence, and therefore they were only acting as agents for a disclosed principal. Mr. Watkins had no power on his own initiative to engage Bowen. The plaintiff was actually introduced to the defendant by Long, and eventually brought along his finished process. It was agreed that he was to receive £500, and an agreement with the new company to be formed, but it was never actually settled who was to pay him; but certainly any out of pocket costs were to be paid by the new company, and not by the defendants.

Mr. Watkins was then called, and said that although he was the managing director of the defendant company he had no power to engage anyone without the authority of the co-directors, and certainly could not have authorised the employment of Bowen without the sanction of the other directors.

Judge Graham gave judgment for the defendants, with costs.

Breach of Contract Claim

£10,500 Judgment against Aniline Dye Director

ON Tuesday Mr. Justice Astbury in the King's Bench Division gave judgment against Mr. James Gibson of Hulme, Manchester, in an action by Mr. Charles W. May Massey, of Llanfairfechan, Carnarvonshire, and Mr. Walter Massey, of Purley, Surrey, claiming against the defendant £10,500 under an agreement and a declaration that they were entitled to an indemnity in respect of a guarantee, and damages for alleged breach of contract.

Mr. H. S. Simmons, for the plaintiffs, said that the defendant did not appear, and his defence had been struck out by order of the Court. He was managing director of the Aniline Dye & Chemical Company in which he held a controlling interest. In 1918 plaintiffs became directors of that company, and each of them subscribed £5,000 in £1 shares. They really invested £10,375, having advanced £375 for shares for clerks in their office. They also persuaded their friends to take up 20,550 shares. In December, 1918, plaintiffs agreed to guarantee to the extent of £5,000 advances made to the company by the bank. The company which was now in liquidation owed the bank something over £20,000. In September, 1920, plaintiffs agreed with the defendant to resign from the Board of Directors, defendant undertaking to purchase their shares for not less than £10,500, to relieve them of their liability under their guarantee to the bank, and to purchase the shares of their friends at not less than par. The shares were now valueless, and the bank had obtained judgment against the company for the amount advanced. The plaintiffs' liability depended upon what the bank recovered.

In reply to his Lordship, Mr. Simmons said it was questionable whether there was any chance of getting anything out of the defendant.

His Lordship gave judgment for plaintiffs for £10,500, granted the declaration as to the indemnity, and gave leave to apply as to damages.

Problems of Atomic Structure

LECTURING at the University College, London, on Monday, Mr. G. B. Jeffery set out to put the Einstein theory of relativity into simple and non-technical language. There was a widespread idea, he said, that relativity was a revolutionary theory superseding all the older theories. If such a theory should ever arise it would have to find a very different apostle from the modest and retiring Albrecht Einstein. A deeper understanding of the theory served but to increase the sense of the way in which it had gradually and almost inevitably grown up, not to the destruction but to the completion of the older theories. The new theory, the lecturer proceeded, had already broken its bounds and spread from its native soil of mechanics into the realm of optics. Could it go further? Could it give us a key to these problems of atomic structure which were so urgently with us to-day? We knew enough to see that the deviations from Newton's laws, so minute in the large scale and comparatively slow motions of the solar system, might rise into importance or even dominance in the smaller scale and rapid motions inside the atom. The material for the solution of the problem was at hand, but the work was difficult, and at the moment we could not solve the relevant equations.

Modern Aspects of Scientific Metallurgy

AT the opening meeting of the Scottish Local Section of the Institute of Metals held in Glasgow on Tuesday, Professor J. H. Andrew delivered an address on "Modern Aspects of Scientific Metallurgy." He pointed out, in the first place, that metallurgical work was not carried on with sufficient scientific accuracy, and too much inexact work had been published. He applied Dr. Irving Langmuir's theory of valency to grain growth and diffusion in metals, pointing out that grain growth and diffusion were due primarily to the unsatisfied atoms on the surface layers. This also accounted for the separation of one metal from another along the grain boundaries, and for the fact that at the grain boundaries the material was stronger in virtue of the two layers of atoms coming into contact. He also referred to the question of the affinity of one metal for another, pointing out that exact determination of affinity values was of great importance from a practical standpoint.

Key Industries Act

Merchants' Complaints and Demand for Revision

WHILE a considerable proportion of the agitation against the Safeguarding of Industries Act no doubt represents a general hostility of all forms of protective tariffs, inquiries in the chemical trade reveal a very strong feeling, on purely business grounds, against the effects of the measure, and efforts will probably be made to secure some revision of the list of articles drawn up by the Board of Trade.

The Chemical and Dyestuff Traders' Association are endeavouring to arrange in connexion with the London Chamber of Commerce a joint conference of representatives of the Chemical and Dyestuff Traders' Association, the British Chemical Trade Association, the Chemical and Fancy Goods Sections of the Chamber, and possibly other interests affected. The view taken is that combined action is much more likely to be effective than sectional and possibly rival influences.

The general committee of the British Chemical Trade Association has adopted and forwarded to the Board of Trade the following resolution :—" That, having reviewed the list of chemical products schedules under the key section of the Safeguarding of Industries Act, 1921, the General Committee of the British Chemical Trade Association desire to place on record their objection to the inclusion of a large number of products which are not being made in the United Kingdom, and also the inclusion of products which have no apparent relation to 'key industries.' They respectfully submit that the inclusion of such products is contrary to the professed intentions of his Majesty's Government to confine the operation of the Bill strictly to 'key industries,' and makes the Act, in effect, not a 'key industry' Act, but, to large extent, a tariff Act. It is further submitted that the inclusion of products which are not being made here and which have no relation to 'key industries' must necessarily have the result of increasing prices to the consumer and manufacturing cost to the manufacturer employing such products as raw materials, and with consequent further impediment to the export trade of this country in manufactured goods. The committee, therefore, suggests that the Board of Trade should immediately appoint a committee for the purpose of revision of the list, and that such committee should be composed of equal numbers of Government officials, chemical manufacturers, chemical merchants, and chemical consumers." In a covering letter it is stated that in the event of the committee's suggestion being adopted, they would be glad to nominate a suitable body of representatives of the chemical merchant trade, including at least one technical expert. Should the suggestion not be adopted, the request is made that the Board of Trade should receive a deputation from the association which would place their views before the department.

Mr. T. R. Brooke (the British Xylonite Co.) presided on Monday over a meeting of the Fancy Goods Section of the London Chamber of Commerce, at which a resolution was passed expressing growing concern at the serious dislocation of business caused by the Act, and calling for the suspension of the measure so far as it concerns commodities not produced in this country.

Sir E. A. Brotherton's Gift to Leeds University

SIR EDWARD ALLEN BROTHERTON, Bart., of Brotherton & Co., Ltd., Leeds, has given £20,000 to the University of Leeds for the development of bacteriological study and research. This is the largest individual gift ever received by the University of Leeds. Sir Edward Brotherton, who is an ex-Lord Mayor of Leeds, has been actively interested in many branches of public life, and a number of good causes have benefited by his generous help, but perhaps nothing has made a stronger appeal to him than the problem of improving the health of the community. In this direction he has been profoundly impressed by the importance of the study of bacteriology. He is chairman of the University Advisory Committee on the Department of Pathology and Bacteriology. Sir Edward maintained and equipped at his own expense the Leeds Pals Battalion early in the war until such time as it was taken over by the War Office.

The death occurred on September 6, after an operation for appendicitis, at Rio de Janeiro, of MR. ALBERT V. BAXTER, a director of the Erasmic Co., Ltd.

Society of Chemical Industry

Manchester Section

THE opening meeting of the 1921-1922 session of the Manchester Section of the Society of Chemical Industry took place on Friday, October 7, at the Textile Institute, under the chairmanship of Dr. E. Ardern. The membership of the section has been fully maintained for the present year, and this, coupled with the fact that the Exhibition of Chemical Products and Apparatus, Fittings and Accessories promoted by the section was in full swing, caused the hall to be crowded to overflowing. Prior to the meeting the number of visitors to the exhibition itself was so great that for several hours the passageways between the stalls had been almost blocked. The arrangements for the exhibition had been made by Messrs. L. G. Radcliffe, Horner, Hubner and Wollaston, and the result was highly gratifying.

At the outset of the meeting the Chairman proposed that a vote of thanks be accorded the exhibitors, which was seconded by Mr. L. G. Radcliffe and carried unanimously.

The success of the present exhibition having been so pronounced, it is probable that an even greater effort may be made by the Manchester Section next year, and that firms interested in chemical matters will be enabled to come into intimate touch with many exhibitors who will be well able to fulfil their usual requirements and to give advice or make suggestions in questions of special difficulty.

A hearty vote of thanks was accorded to the executive committee of the exhibition, to which Mr. L. G. Radcliffe suitably responded. A list of the exhibitors and their exhibits has already appeared in these columns.

Afterwards Dr. Ardern delivered his presidential address on " The Disposal of Waste Liquors," a report of which appears on page 454.

Tenders Invited for Disinfectants and Linseed Oil

THE Administration of the South African Railways and Harbours has invited tenders for the supply and delivery of 14,400 gallons of disinfectant fluid, 14,550 lb. of disinfectant powder, 8,300 imperial gallons of raw linseed oil, and 9,800 imperial gallons of linseed oil (double boiled). Tenders must be submitted on the printed forms provided by the Administration, and will be received up till noon on October 31 in respect of the disinfectant fluid and linseed oil, and up till noon on November 14 in respect of the disinfectant powder. In view of the limited time allowed for the submission of tenders, this information will only be of use to United Kingdom firms who have agents in South Africa, who can be instructed by cable. Copies of the specification, conditions of tender, and tender form relating to each of these contracts may be inspected by United Kingdom manufacturers and exporters on application to the Enquiry Room, Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1.

Tenders Invited for Tar or Tar Substitutes

THE Municipal Council of Johannesburg has invited tenders for the supply of 1,600 tons of tar or tar substitute. Tenders must be addressed to the Town Clerk and placed in the Tender Box, 1st Floor, Municipal Office, Johannesburg, not later than noon on November 18. The Municipal Council attaches importance to tenderers being represented locally, and it is improbable that any firm not so represented will secure the contract. The Department of Overseas Trade is prepared to render assistance in the appointment of agents. A copy of the specification, tender form and conditions of tender relating to this contract may be inspected by United Kingdom manufacturers and exporters on application to the Inquiry Room, Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.

The secretary to the London committee of SPRINGS MINES, LTD., announces that the following cablegram has been received from the head office of the company in Johannesburg :— Directors have decided in extending reduction plant to discard stamp battery and plate amalgamation and adopt all-sliming of ore and direct cyanide treatment. Decision come to as a result of metallurgical experiments, and will result in reduced capital expenditure, probable saving operating costs, increased extraction gold contents.

From Week to Week

PATENT FUEL shipments from Swansea during September showed a decrease of 8,000 tons.

The offices of the GENERAL PETROLEUM CO. OF TRINIDAD, LTD., have been removed to Portland House, 73, Basinghall Street, E.C.

The completion on Wednesday of the "SHELL" CORNER BUILDING, Kingsway, W.C., was marked by the opening of the staff restaurant, which provides for ample accommodation for the 680 employees of Shell Mex, Ltd.

At a meeting of the London Chamber of Commerce on Tuesday it was stated that the importation of dolls' heads had been stopped under the Safeguarding of Industries Act, as the eyes were made of SCIENTIFIC GLASS.

The death occurred at Glasgow, on October 10, of Mr. CORNELIUS HOPE who was until recently connected with the Northern Chemical Co., Ltd., 16, Blythswood Square, Glasgow, and formerly with the St. Rollox Chemical Works.

The fourth annual STREATFEILD MEMORIAL LECTURE will be delivered at the Finsbury Technical College, Leonard Street, E.C.2. by Mr. W. P. Dreaper, on October 20, at 4 p.m. The subject will be "Chemical Industry a Branch of Science." Admission will be free.

MR. ALFRED CHASTON CHAPMAN, F.R.S., president of the Institute of Chemistry of Great Britain and Ireland, has been appointed by the King to be a member of the Royal Commission on Awards to Inventors, in the room of Sir James Johnston Dobbie, D.Sc., F.R.S., resigned.

At a meeting of the Institution of Petroleum Technologists, held at the Royal Society of Arts, John Street, Adelphi, on Tuesday, a paper on "The Geology of the Egyptian Oilfields" was communicated by Dr. W. F. Hume. The president, Professor J. S. S. Brame, was in the chair.

It has been reported in the United States that a Japanese Company has taken up an option for the MANUFACTURE OF SYNTHETIC AMMONIA under the Claude process. It is understood that under the terms of the option the Japanese firm will pay 7,000,000 fr. to the Société de L'Air Liquide.

The public examination of ARTHUR FULFORD, trading as A. Fulford & Co., 71, Bowdon Street, Sheffield, wholesale druggist, was held recently at the County Court Hall, Bank Street, Sheffield. The liabilities were returned at £811 11s. 4d., and there was a deficiency of £338 19s. 9d.

The Royal Institute of Public Health has issued a programme of a course of weekly lectures on problems of public health in relation to INDUSTRIAL HYGIENE. The course opens on October 19. The last lecture of the series, on "Lead Poisoning in Industry," will be delivered by Sir Kenneth Goadby.

Ten blind students of Worcester College for the Higher Education of the Blind will be in residence at Oxford this term. One of them, MR. W. RIGBY, created what is said to be a RECORD FOR THE BLIND by passing in theoretical and practical chemistry, a feat which a few years ago would have been deemed inconceivable.

MR. HUGH THOMSON, a director of James Taylor (Trongate), Ltd., wholesale druggists, Glasgow, was presented, on the occasion of his having completed 50 years' service, with a wallet containing Treasury notes by Mr. Taylor, managing director, on behalf of the directors and employees. Mrs. Thomson was the recipient of a gold wristlet watch.

In connexion with the British Association of Chemists, a GUILD OF DYESTUFFS INDUSTRY CHEMISTS has been formed, the inaugural meeting having been arranged to take place at the Albion Hotel, Manchester, on October 31, at 7 p.m. The Secretary of the British Asssociation of Chemists, 108, Baker Street, W. 1, will supply particulars on application.

THE MINERS' SAFETY EXPLOSIVE COMPANY, London, have purchased Penrhyn Munition Works site, and the chemical plants and laboratories there. They have also acquired a freehold farm in close proximity to the works with a view to extending the powder works, which during the war employed over 200 men. The works are situated at Penrhyndeudraeth, Merionethshire.

Bradford Gas Committee having considered a report of the manager of the chemical works on the objects of the British Sulphate of Ammonia Federation, Ltd., have decided that the Corporation be associated with the Federation by entering into an agreement with that body with regard to the SALE OF SULPHATE OF AMMONIA produced at the Gas Committee's chemical works.

After being actively associated with the business for 36 years COUNCILLOR JAMES WOODHEAD, of Godfrey Woodhead & Son, chemical manufacturers, Slaithwaite, Yorks, has retired and the business has been taken over by Major J. H. Crossley. On October 5 the employees made a presentation to Councillor Woodhead of a partridge cane walking stick with ebony handle and silver mounts.

THE BIRMINGHAM METALLURGICAL SOCIETY opened its session on October 6 at the Birmingham Chamber of Commerce. The new president, Dr. F. Johnson, spoke on the training, sphere of work and qualifications of metallurgists and industrial chemists. Without science, he said, industry must languish and decay. No foundations needed to be more well and truly laid than those of scientific learning.

At a recent meeting of the Gas Committee of Glasgow Corporation it was reported that the BRITISH SULPHATE OF AMMONIA FEDERATION had invited them to appoint two representatives to the Scottish Propaganda Committee of this Federation. It was agreed that Councillor John C. Drummond and the Gas Manager should be appointed to represent the Glasgow Corporation in this capacity.

The tenth annual dinner of the Finsbury Technical College Old Students' Association will be held at the Engineers' Club, Coventry Street, London, on Saturday, November 12, when the chair will be taken by the President, Professor G. T. Morgan, F.R.S. Old students of the College may obtain tickets (price, 10s. 6d. each) from the honorary secretary, Mr. H. P. Guy, 209, Northumberland Park, Tottenham, N.17.

The Disposal and Liquidation Commission announce that they have entered into a contract with CHARLES TENNANT & CO., LTD., of 93, West George Street, Glasgow, for the disposal of the unsold balance of chemicals and explosives on a commission basis, Messrs. Tennant undertaking the inspection, cataloguing and grading of the various materials. All future inquiries with regard to these materials should be referred to them at the above address.

The attention of the Glasgow Corporation COMMITTEE ON AIR PURIFICATION was directed at its last meeting to a conviction for emitting black smoke recorded against one of the works of the chemical section of Glasgow Gas Department, and to the report of a further alleged contravention of the kind by the same department. A recommendation to the Corporation asking them to caution municipal enterprises against contributing to the impurity of the atmosphere was agreed to.

It has been decided to postpone the idea of forming an ENGINEERS' CLUB in Birmingham until times are more favourable. A fairly large measure of support had been promised by chemical, electrical, mechanical, gas, mining and civil engineers. The idea was to have a minimum membership of 500, and £10,000 was wanted for the club premises and equipment. At a luncheon on October 7 Mr. R. A. Chattock stated that 330 members were enrolled and £4,500 had been obtained.

The next meeting of the SOCIETY OF GLASS TECHNOLOGY will be held in the Mappin Hall, Applied Science Department, the University, St. George's Square, Sheffield, on October 19, at 2.45 p.m., when the following papers are expected to be read: "The Properties of the Lime-Magnesia (Dolomitic Lime) Glasses and their Commercial Application," by Violet Dimbleby, S. English, F. W. Hodkin, and Dr. W. E. S. Turner, and a "Note on the Composition, or the Comparative Composition, of Glass House Pots in Olden Times," by G. V. Evers.

At a meeting of the Governors of George Heriot Trust in Edinburgh on Monday Bailie Barrie intimated that Messrs. Bertrams Ltd., Edinburgh, had presented to the Heriot-Watt College a model working papermaking plant, comprising digester, beater, and papermaking machine. This, he said, was the most handsome present which had ever been made to the college by a private firm, and it would not only be of great assistance in the teaching of the CHEMISTRY OF PAPERMAKING to the students for the college diploma in chemistry, but should also prove of great interest to the students attending the classes in the printing and allied trades.

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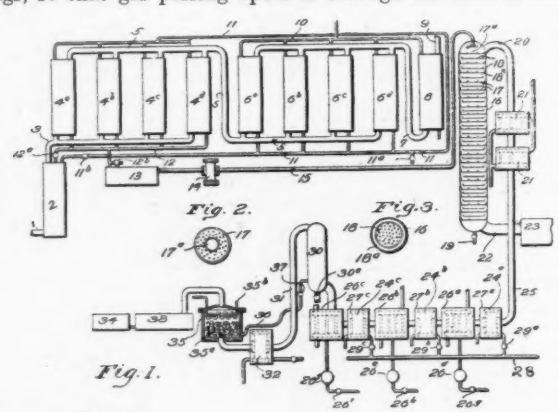
Abstracts of Complete Specifications

168,627. SULPHUR DIOXIDE FROM FURNACE GASES AND OTHER GASES CONTAINING THE SAME, METHOD OF, AND APPARATUS FOR THE RECOVERY OF. A. H. Eustis, Milton, Norfolk, Mass., U.S.A. Application date, May 4, 1920.

The apparatus is for recovering sulphur dioxide from furnace gases, smelter smoke, or the like. The gas passes from a flue 1 to a tower 2 where it is cleaned and cooled and thence through a pipe 3 to a series of scrubbing towers 4*a*, 4*b*, 4*c*, 4*d* in parallel. These towers are packed with coke, slag or the like, over which the absorbing liquor passes downwards. The gas then passes by a pipe 5 to another series of scrubbing towers, 6*a*, 6*b*, 6*c*, 6*d*, also in parallel, and to tower 8. The tower 8 is preferably packed with limestone or other soluble material which increases the capacity of the liquid for absorbing sulphur dioxide, and thus removes the last traces from the gas. Water is fed to the scrubbing towers 6 and 8 in parallel from a pipe 10, and the outflow from the tower 8 may be passed to the top of the towers 6 and 4. The outflow from the towers 6 may be partly passed into the top of the hot tower 2 where its sulphur dioxide is given up, and partly into the scrubbers 4. The solution from the towers 4 passes to a closed storage tank 13 and then through a pump 14 and pipe 15 to the top of the tank 16. This tank is provided with a series of shelves 17 having central openings, arranged alternately with shelves 18 having peripheral openngs, so that gas passing upwards through the tank is com-



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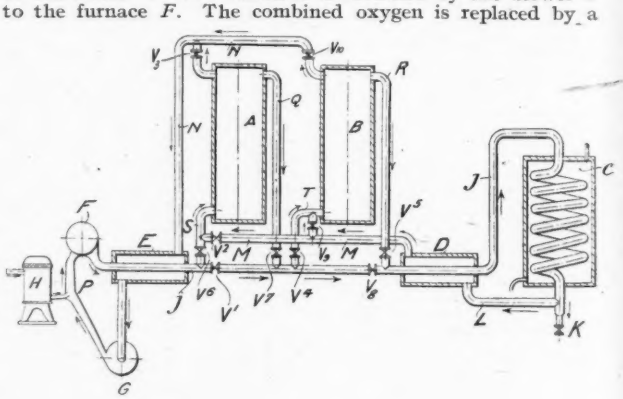
pelled to follow a tortuous path. The shelves are also perforated with small holes to distribute the liquid which flows downward. Steam is passed upwards from the pipe 22 to the outlet 20, so that the partial pressure of the sulphur dioxide in the atmosphere in contact with the liquor is reduced, and the extraction of the gas is thereby facilitated. The steam also furnishes heat which facilitates the liberation of the gas. The use of steam may be supplemented by the use of a vacuum pump connected to the pipe 20. The sulphur dioxide gas is partly dried in the upper part of the tank 16 by condensation of water. The sulphur dioxide then passes to refrigerators 21 where further drying is effected and thence by a pipe 25 to a vacuum pump 24*a*. The subsequent passage of the gas through pumps 24*b*, 24*c* and coolers 26*a*, 26*b*, 26*c*, cooler 30, compressor 32, liquid trap 35, and condenser 33, is fully described in Specification No. 167,725, while the removal of the last trace of moisture by means of liquid sulphur dioxide in the trap 35 is described in Specification No. 167,726, *see* THE CHEMICAL AGE, Vol. V., p. 348. Instead of absorbing the sulphur dioxide in water it may be chemically absorbed in a solution of a salt such as aluminium or iron sulphite. The gas may be subsequently liberated from the solution by reducing the partial pressure. The aluminium sulphite may be obtained by placing bauxite in the tower 8. Reference is directed in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts, 1907 and 1919, to Specifications Nos. 26,152/1908, and 1,882/1909.

168,643. ANHYDROUS ALUMINIUM CHLORIDE, PROCESS FOR PRODUCING. P. Danckwardt, 2542, South Grant Street, Denver, Col., U.S.A. Application date, June 2, 1920.

The process is for obtaining aluminium chloride by electrolysis of a molten heavy metal chloride, with an aluminium compound in contact with the positive pole. The anhydrous aluminium chloride volatilises and is condensed in another vessel. The aluminium compound may be the waste product obtained as a cake or residue in the process of treating mineral oils with anhydrous aluminium chloride to produce gasolene. The spent aluminium chloride is thus regenerated. Alternatively a mixture of aluminium oxide and carbon may be used. The electrolyte is preferably zinc chloride. When the charge is electrolysed carbon monoxide and hydrochloric acid or chlorine are first given off, and these are followed by anhydrous aluminium chloride. The latter is condensed in a closed chamber and the residual gas is then passed through a vessel containing water with zinc oxide in suspension. Zinc is also liberated in the electroliser and is drawn off. When the zinc oxide has been completely converted into zinc chloride, it may be evaporated to dryness and used in the electrolyser.

168,651. NITROUS GASES, PROCESS OF ABSORBING. F. W. Howorth, London. (From Norsk Hydro-Elektrisk Kvaelstofaktieselskab 7, Solligaten, Christiania, Norway.) Application date, June 2, 1920.

Nitrous gases from an electric furnace *F* pass through a preheater *E*, pipe *J*, and another preheater *D* to a refrigeration plant *C* in which the greater proportion of the nitrogen compounds are condensed. The uncondensed gas passes by a pipe *L* to the heater *D* and thence by the pipes *M* and *S* to an absorber *A*. The absorber is packed with briquettes of burnt lime or slaked lime. The gas then passes through a pipe *N* to the heater *E* from which it is returned by the blower *G* to the furnace *F*. The combined oxygen is replaced by a



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further supply from the pump *H*. When the material in the tower *A* is completely converted into nitrates the tower may be isolated from the system by closing valves V^2, V^3, and the nitrates discharged. A similar tower *B* may then be placed in the circuit. The hot gases from the furnace *F* may be diverted through the chamber *A* so as to decompose the calcium nitrate and nitrite by heat, and the combined gas then passes through the pipe *Q* into the pipe *J* and cooler *C*, while the uncondensed gases pass on to the absorption tower *B*. The process may be worked as a cyclic system by using the towers *A* and *B* alternately for absorption. In this process only the last traces of nitrous gas are absorbed in the towers *A* and *B*.

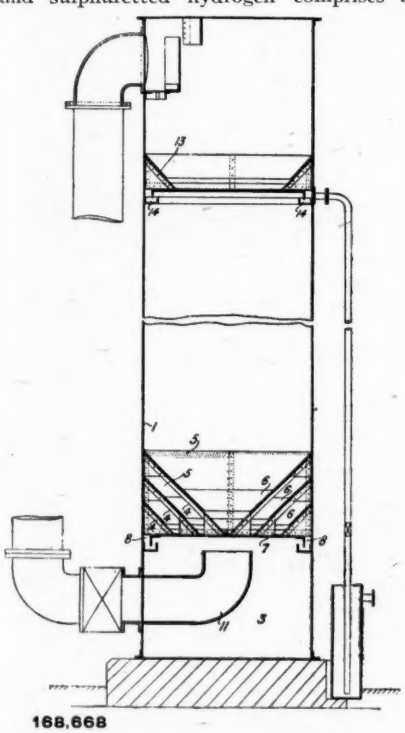
168,659. SOLUTIONS OF SILICIC ACID, SILICATE CEMENTS AND SILICATE PHOSPHATE CEMENTS, MANUFACTURE OF. W. Carpmael, London. (From Farbenfabriken vorm. F. Bayer & Co., Leverkusen, near Cologne, Germany.) Application date, June 4, 1920.

The process is more particularly for the manufacture of silicate cements and silicate phosphate cements from inorganic bases such as magnesium or beryllium oxide and hydrolysed

organic compounds containing a high proportion of silicic acid. In an example, tetramethylic silicate is hydrolysed by means of water or dilute hydrochloric acid, and the solution is mixed with a finely powdered mixture of feldspar and 0·5 per cent. of magnesium oxide. The resulting cement is of great hardness and is insoluble in water and dilute acids. Other examples are given in which the organic silicon compound is obtained (1) by heating tetramethylic silicate with phosphoric anhydride and adding water, (2) by mixing hexamethylic disilicate with tetramethylic silicate and adding water, (3) by mixing hexamethylic silicate, tetramethylic silicate and aluminium methylate, and heating with a reflux condenser and then hydrolysing with water. It is usually found that very dilute hydrochloric acid is preferable to water for hydrolysis. Polyesters such as those obtained by treating four molecules of tetramethylic silicate with three molecules of water may also be used.

168,668. Gas Scrubbing and Washing Apparatus. J. K. Frazer, 145, Greenhead Street, Glasgow. Application date, June 5, 1920.

The apparatus for washing and scrubbing coal gas or water gas with ammoniacal liquor to neutralise carbon dioxide and sulphuretted hydrogen comprises a tower 1 having a series of spraying devices (not shown) projecting through the walls at various heights. The base is provided with a skeleton structure 4 carrying a series of co-axial, hollow, perforated, frusto-conical elements 5, and another series of unperforated elements 6. The liquor which is sprayed into the tower is directed by the elements 6 on to an unperforated plate 7, from which it flows through an annular liquid seal 8 to the receiver 3. The gas to be washed is introduced through the pipe 11 and passes upwards through the seal 8 and through the cascades of liquid which are produced by the elements 5 and 6. The ammoniacal liquor is pumped continuously from the receivers 3 to the sprayers. To remove traces of ammonia a purifier is superposed on the tower into which liquid is sprayed on to a conical element 13, while the gas passes upwards through a liquid seal 14.



168,668

168,681. Ortho-Oxy-Azo-Dyestuffs, Manufacture of. A. G. Bloxam, London. (From Akt.-Ges. für Anilin-Fabrikation, Berlin, S.O. 36, Germany.) Application date, June 8, 1920.

A new dyestuff for wool is prepared by combining a diazotised-2-aminophenol having one or more halogen atoms or nitro groups or both, or homologues of these compounds with an 8-halogen-1-oxynaphthalene-5-sulphonic acid. In an example, 4-chloro-2-aminophenol is diazotised by sodium nitrite and hydrochloric acid and the diazo compound is run into 8-chloro-1-oxynaphthalene-5-sulphonic acid and sodium carbonate, and the dyestuff is salted out. Similar dyestuffs may be obtained by the use of 4-nitro-, 4:6-dichloro-, 3:4:5:6-tetrachloro-, 4-bromo-, 4-methyl-6-bromo-, 4:6-dinitro-, or 4-methyl-5-nitro-2-aminophenol.

168,689. Symmetrical Alkylated Metaphenylene-Diamines, Manufacture of. British Dyestuffs Corporation, Ltd., Imperial House, Kingsway, London, W.C.2; A. G. Green, of British Dyestuffs Corporation, Ltd., Manchester, and A. Brittain, of Compania Mexicana de Petrolis "El Aguila," Tampico, Mexico. Application date, June 11, 1920.

The usual process for obtaining symmetrically alkylated metaphenylene diamines is by direct alkylation of metaphenylene diamine or its acidyl derivatives, but it is now found that a more convenient method is the action at temperatures varying from 125°C. to 260°C. of primary or secondary alkyl amines or their salts on resorcinol in alcoholic or aqueous solution, with or without sulphurous acid. The best yield is obtained by the use of alkyl amine sulphites. Detailed examples are given of the production of symmetrical dimethyl-*m*-phenylene diamine, tetramethyl metaphenylene diamine and tetraethyl metaphenylene diamine.

168,729. Mixing Granular, Powdered or Like Substances. A. B. Smith, 35, Brookfield Terrace, Fairfield, Lancs, H. A. Skelley, Edenhurst, Marple, Cheshire, and Continuous Reaction Co., Ltd., 155, Church Road, Battersea, London, S.W.11. Application date, July 2, 1920.

A rotary mixer comprises a drum of triangular cross-section mounted on a horizontal shaft. Each of the three rectangular sides thus formed forms the base of a pyramidal pocket projecting radially outwards. The pockets are of a depth greater than the dimension of their bases.

168,791. Tin Oxidising Furnaces. W. H. Boorne, Bush Lane House, Cannon Street, London, E.C.4. Application date, September 23, 1920.

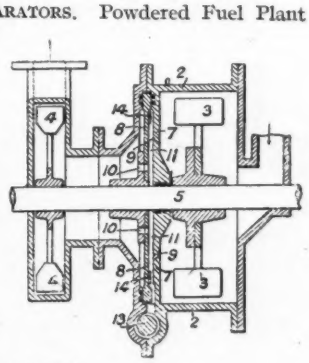
The furnace is for producing tin oxide which is pure white and of a soft amorphous nature, and for this purpose it is necessary to maintain a very uniform high temperature. The metal is contained in an open fireclay tray in an oxidising chamber which is heated by an oil furnace. The combustion chamber is arranged horizontally below the oxidising chamber with which it communicates by a vertical passage at one end, while air and oil are introduced at the opposite end. Air passages are also arranged adjacent to and on both sides of the combustion chamber, and are provided with regulating dampers at the inlet ends. The air is thus preheated and is delivered into the vertical passage connecting the combustion chamber with the oxidising chamber so as to regulate the temperature of the latter. Oxidation of the tin is assisted by the injection of steam or water into the passages.

Note.—Abstracts of the following specifications which are now accepted appeared in The Chemical Age when they became open to inspection under the International Convention: 143,872 (Union Carbide Co.), relating to calcium carbide, *see* Vol. III., p. 163; 146,092 (Soc. Chimique des Usines du Rhone anciennement Gilliard, P. Monnet et Cartier), relating to cellulose esters, *see* Vol. III., p. 320; 146,939 and 146,942 (W. E. Trent), relating to treating ores, &c., *see* Vol. III., p. 381-2: 147,519 (G. F. Jaubert), relating to manufacture of hydrogen by means of silicon and its alloys, *see* Vol. III., p. 429; 148,358 (G. Teichner), relating to oxidation of liquid hydrocarbons, *see* Vol. III., p. 486; 150, 734 (P. L. Pfannenschmidt), relating to acid chambers, &c., *see* Vol. III., p. 634.

International Specifications not yet Accepted

167,739. Centrifugal Separators. Powdered Fuel Plant Co., Ltd., 47, Victoria Street, Westminster. (Assignees of C. M. Stein, 48, Rue la Boetie, Paris.) International Convention date, August 12, 1920.

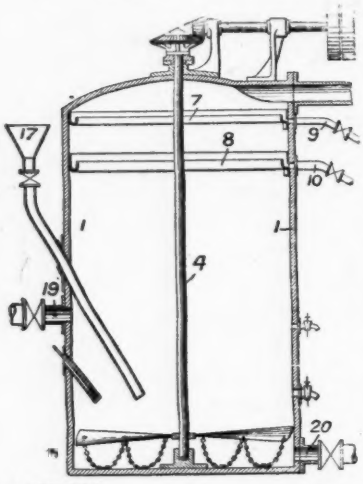
Air containing finely divided matter in suspension is drawn by a fan 4 into a pulveriser 2 containing rotating impact blades 3. The air then passes through openings 9 in the wall 7 into a flat chamber 11, which is bounded on the opposite side by a rotating disc 8.



167,739

The suspended matter is separated by centrifugal force, and is transferred by the aid of projections 14 to a conveyor 13, which discharges it. The air passes on through ports 10 nearer the axis than the ports 9, and thence to the exhaust fan 4.

167,733. PITCH AND OILS. Soc. d'Exploitation des Brevets C. Arnould, 104, Rue St. Lazare, Paris. International Convention date, August 13, 1920.



167,733

Tar or heavy oil is admitted through a pipe 19 to a retort 1, and mixed with about 4 per cent. of hydrochloric acid admitted through a funnel 17, by means of a rotating stirring device 4. The mixture is heated to 350°C. and vapour is condensed in the channels 7, 8, and run off through pipes 9, 10. Alternatively air may be passed through a boiling mixture of heavy oil and hydrochloric acid. Pitch and light tar or other oils are obtained, and may subsequently be distilled to obtain benzol, naphthalene, &c. The residue is with drawn through a pipe 20.

167,738. OILS. Trent Process Corporation, 1440, U Street, Washington, D.C., U.S.A. Assignees of W. E. Trent, 508, G Street, Washington. International Convention date, August 11, 1920.

Acid and aqueous sludges are agitated in presence of water with comminuted carbon or other substance having a selective affinity for the contained oil. The mixture of oil and carbon is removed, and may be used as a fuel or may be distilled at a low temperature to separate the oil and recover the carbon.

167,740. CARBON AND CHARCOAL. H. E. Brown, 15, West Chestnut Street, Kingston, New York. International Convention date, August 12, 1920.

A mixture of lampblack 6 parts, by-product coke oven pitch 3 parts, and by-product coke oven light oil 1 part is pumped with water through a filter press, and then dried until the moisture content is reduced to 10-15 per cent. The mixture is then briquetted, broken up, and heated in a retort until the volatile constituents are mainly cracked and driven off. The mixture is then broken up. Each granule consists of a framework of dense hard carbon with a filling of soft spongy carbon, and the material is suitable for bleaching or filtering.

167,741. GOLD, EXTRACTING FROM ORES. Blei-und Silberhütte Braubach Akt.-Ges., Braubach-on-Rhine, Germany. International Convention date, August 12, 1920.

The ore is smelted with such additions as will produce a slag of high melting point free from metals. Oxides of antimony, &c., are volatilised, and the gold is mixed with iron, copper, or other metal which was originally present or is added. The other metal is dissolved out, or the mixture is smelted, or subjected to cupellation to recover the gold.

167,752. HYDROCHLORIC ACID. Rheinisch-Nassauische Bergwerks- & Hutten-Akt.-Ges., Stolberg, Rhineland, and G. Schüphans, Nievenheim, Germany. International Convention date, August 16, 1920.

Crude hydrochloric acid is heated to boiling point to remove volatile impurities, and then passed continuously at a regulated rate into stills in a muffle furnace, the concentration of the distilled acid being regulated by the rate of admission.

167,769. AMMONIUM CHLORIDE. A Riedel, Koessern, Grimma, Germany. International Convention date, August 13, 1920.

Ammonium chloride solution is allowed to flow over calcium carbonate to obtain a completely neutral solution, and to prevent corrosion of the iron apparatus during manufacture.

167,781. DIALKYLAMINOALKYL COMPOUNDS. Farbwerke vorm. Meister, Lucins & Brüning, Hoechst-on-Main, Germany. International Convention date, August 13, 1920.

Two methods of preparing dialkylaminoalkyl compounds are described: (1) By treating halogenalkyldialkylamines with alkali salts of compounds of the type $R.CO.CHR_1.X$ where R, R_1 are hydrogen or radicals, and X a group such as $COOC_2H_5$, $CO.CH_3$, $CO.C_6H_5$, or CN, *e.g.*, acetoacetic ester, cyanacetic ester, malonic ester, acetonedicarboxylic acid ester, camphorcarboxylic acid ester, succinylsuccinic acid ester, or acetylacetone. (2) By treating halogen alkyl derivatives of bodies of the above type, such as bromethylacetate or bromethylacetoacetic ester with dialkylamines. Examples are given of the preparation of *a*-diethylaminoethylacetoacetic ester, *a*-diethylaminoethylaceto acetic methyl ester, *a*-dimethylamino-ethyl-acetoacetic ethyl ester, diethylaminobutylacetoacetic ethyl ester, diethylaminoethyl-malonic diethyl ester, diethylaminoethyl-cyanacetic ester, bis-diethylaminoethyldiketohexamethylenedicarboxylic acid diethyl ester, diethylaminoethyl-acetonedicarboxylic acid diethyl ester, diethylaminoethyl-camphorcarboxylic acid methyl ester, and diethylaminoethyl-acetylacetone; also chlor- and brom-ethyldiethylamine, and chlorbutyldiethylamine.

LATEST NOTIFICATIONS.

169,687. Brown dyestuffs. Soc. Chimique De La Grande Paroisse. September 30, 1920.

169,688. Process for the separation of aromatic natrimines. Soc. Chimique De La Grand Paroisse. September 30, 1920.

169,692. Filters for purifying air or gases. Beth, W. F. L. September 30, 1920.

169,695. Treatment of fibrous materials with liquids. Linnemann, F. October 1, 1920.

169,703. Bearing metal alloy. Goldschmidt, Akt.-Ges., T. October 1, 1920.

169,722. Process for the purification of tannin. Byk Guldenwerke Chemische Fabrik Akt.-Ges. October 1, 1920.

169,725. Receptacles for the transportation and preservation of air or other gases in the liquefied state. Wendel et Cie, Les Petits Fils De F. De. October 4, 1920.

Specifications Accepted, with Date of Application

140,394. Nitrogen compounds, Production of. Nitrogen Corporation. September 1, 1917.

140,439. Ammonia, Production of. Nitrogen Corporation. March 17, 1920.

144,617. Tanning materials and method of producing same. A. Koetzle. June 6, 1919.

145,054. Trisazo dyestuffs, Manufacture of. Akt.-Ges. für Anilin Fabrikation. June 4, 1915.

145,079. Evaporation or inspissation of solutions, Process and means for—and also for effecting chemical reactions. G. A. Krause. January 29, 1917. Addition to 17,508/13.

145,090. Refining liquids from suspended impurities, Process for. Sharples Speciality Co. October 3, 1917.

145,789. Tin and antimony, Process for refining. G. Bonnard. April 5, 1919.

147,232. Wood and other cellulose-containing materials, Process for the treatment of. Zellstoff fabrik Waldhof. October 19, 1916.

147,648. Heavy hydrocarbons into lower-boiling specifically lighter products, Process for cleaving and converting. C. Cordes. July 28, 1914.

149,247. Chloridising roasting of burnt pyrites, Process of—and furnace therefor. J. Simon. August 2, 1917.

153,297. Sulphur, Process for obtaining—or for treating and purifying gases containing hydrogen sulphide. Farbenfabriken vorm. F. Bayer & Co. October 30, 1919.

165,084. Hexamethylenetetramine, Process for the manufacture of a new derivative of. Chemische Fabrik vorm. Sandoz. June 12, 1920.

169,192. Calcium and magnesium from rock salt brine or solutions of rock salt in water, Removal of. F. A. Freeth and L. A. Munro. April 18, 1920.

169,198. Isobornyl-ester-camphene mixture and process of making same. L. G. Wesson. May 17, 1920.

169,247. Nickel and nickel salts, Manufacture of. E. E. Naef. June 19, 1920.

169,264. Sulphuric anhydride, Apparatus for the manufacture of. P. Audianne. June 21, 1920.

169,267. Liquids under pressure, Apparatus for supplying. British Cellulose & Chemical Manufacturing Co., Ltd., and W. H. Wilson. June 21, 1920.

169,288. Ore concentration. Minerals Separation, Ltd. (E. W. Wilkinson.) June 23, 1920.

169,301. Alumina from clay, Process for the preparation of. F. W. Howorth (Aktieselskabet Hoyangsfaldene Norsk Aluminium Co.). June 29, 1920.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

Market Report

THURSDAY, October 13, 1921.

The demand for chemicals during the past week has been hardly so active, although there is again an improvement as we go to press. Prices generally, however, remain firm, and whilst movements have been within smaller compass they have mostly been in an upward direction.

The export demand has been rather quieter and without special feature.

General Chemicals

ACETONE remains in good demand and the price is very firm.

ACID ACETIC is particularly scarce for prompt delivery. The demand continues good and the tendency is favourable to holders.

ACID CITRIC is featureless.

ACID FORMIC has been in rather better demand and the price is higher.

ACID OXALIC.—The advance in price is fully maintained and higher prices seem to be inevitable as stocks decline.

ACID TARTARIC remains slow of sale but prices are above the lowest.

BLEACHING POWDER is still hanging fire and the position seems likely to remain unsatisfactory until export demand revives.

COPPER SULPHATE is unchanged.

FORMALDEHYDE.—Stocks are passing steadily into consumption. The price is unchanged.

IRON SULPHATE.—A moderate business is reported at recent levels.

LEAD ACETATE is in very poor demand and stocks are difficult to dispose of.

LEAD NITRATE is quiet, and the price is upheld.

LITHOPONE remains inactive, but the price now seems to be slightly firmer.

POTASSIUM CARBONATE is uninteresting and lower prices are not improbable.

POTASSIUM CAUSTIC.—The market is still controlled by the stocks here and the tendency remains in buyers' favour.

POTASSIUM CHLORATE is slow of sale but nominally unchanged in price.

SODIUM ACETATE is in poor demand and the tendency is towards higher prices.

SODIUM BICHROMATE has not been in quite such active demand, but on the whole the healthier tendency is maintained.

SODIUM CAUSTIC is a very slow market; the nominal prices have not undergone alteration.

SODIUM NITRITE is in fair demand, but business is of the hand to mouth variety.

SODIUM PHOSPHATE is rather uninteresting, although the price seems to be on bottom.

SODIUM PRUSSIATE is in strong demand and the limited quantities available are eagerly snapped up. The advance in price has been fully maintained.

Coal Tar Intermediates

The revival indicated in our last report is maintained, and while the volume of trade passing continues to grow, this is naturally a slow process. Inquiries, however, continue to grow in number, and as stocks of some products are getting distinctly low, an upward tendency is not impossible in the near future. Export inquiries also continue very fair.

ALPHA NAPHTHYLAMINE.—Some fair-sized orders are in the market, and the price remains unchanged.

ALPHA NAPHTHOL continues in steady, quiet demand.

ANILINE OIL AND SALT.—A certain amount of business is passing, but the prices are maintained and consumers are inclined to hold off.

ANTHRAQUINONE is quiet.

BETA NAPHTHOL is in steady demand at recent figures.

DIMETHYLANILINE is steady at last quoted price.

DIPHENYLAMINE continues in request both for home and export, and stocks of this material are not excessive.

PARANITRANILINE is unchanged.

RESORCIN has been inquired for.

SALICYLIC ACID is in small request at recent values.

Coal Tar Products

There is little change from last week in the condition of the market for coal tar products.

90 PER CENT. BENZOL is slightly more plentiful, but the price is maintained at 2s. 9d. to 2s. 10d. in the Midlands and 3s. in London.

PURE BENZOL is quoted at 3s. 6d. per gallon on rails.

CREOSOTE OIL is weak, and is worth about 7½d. on rails in the North, and 8d. to 8¼d. in the South.

CRESYLIC ACID is quoted at 2s. 2d. on rails for the pale quality, and 1s. 9d. to 1s. 11d. for the dark quality.

SOLVENT NAPHTHA is worth about 2s. 9d. on rails in the Midlands and 3s. in the South, although there is little fresh inquiry for this product, and the market is certainly not any stronger than it was.

NAPHTHALINE is very quiet, crude qualities being worth from £5 to £8 per ton, and refined qualities from £15 to £17 per ton.

PITCH.—The market is quiet, and prices have shown a downward tendency. To-day's values are approximately 62s. 6d. to 65s., f.o.b. London, and 60s. to 62s. 6d., f.o.b. East Coast.

Sulphate of Ammonia

The market remains firm with good demand both for home trade and for export. The production is still limited, and prices have an upward tendency.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	1	to	0	2	2
Acetone oil	ton	87	10	0	to	90	0	0
Acetone, pure	ton	90	0	0	to	95	0	0
Acid, Acetic, glacial, 99-100%	ton	60	10	0	to	62	10	0
Acetic, 80% pure	ton	45	0	0	to	48	0	0
Arsenic	ton	95	0	0	to	100	0	0
Boric, cryst	ton	65	0	0	to	68	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6½	to	0	0	7
Citric	lb.	0	2	5	to	0	2	6
Formic, 80%	ton	65	0	0	to	67	10	0
Gallic, pure	lb.	0	3	9	to	0	4	0
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	43	0	0	to	45	0	0
Lactic, 60 vol.	ton	46	0	0	to	48	0	0
Nitric, 80 Tw.	ton	38	0	0	to	40	0	0
Oxalic	lb.	0	0	8½	to	0	0	9
Phosphoric, 1.5	ton	45	0	0	to	47	0	0
Pyrogallic, cryst	lb.	0	7	3	to	0	7	6
Salicylic, Technical	lb.	0	1	2	to	0	1	3
Salicylic, B.P.	lb	0	1	6	to	0	1	7
Sulphuric, 92-93%	ton	8	0	0	to	8	10	0
Tannic, commercial	lb.	0	3	6	to	0	3	9
Tartaric	lb.	0	1	5	to	0	1	6
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	37	10	0	to	40	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17-18%	ton	15	0	0	to	16	0	0
Ammonia, anhydrous.	lb.	0	1	10	to	0	2	0
Ammonia, .880	ton	35	0	0	to	37	0	0
Ammonia, .920	ton	22	0	0	to	24	0	0
Ammonia, carbonate	lb.	0	0	4	to		—	

	per	£	s	d.		£	s	d.
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	45	0	0	to	47	10	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	90	0	0	to	95	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	150	0	0	to	160	0	0
Arsenic, white, powdered	ton	42	0	0	to	44	0	0
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	15	0	0	to	16	0	0
Nitrate	ton	42	10	0	to	45	0	0
Barium Sulphate, blanc fixe, dry	ton	26	0	0	to	28	0	0
Sulphate, blanc fixe, pulp	ton	16	0	0	to	16	10	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	14	0	0	to		—	
Borax crystals	ton	31	0	0	to	32	0	0
Calcium acetate, Brown	ton	8	0	0	to	9	0	0
,, Grey	ton	10	0	0	to	11	0	0
Calcium Carbide	ton	22	0	0	to	23	0	0
Chloride	ton	12	10	0	to	13	0	0
Carbon bisulphide	ton	60	0	0	to	62	0	0
Casein, technical	ton	85	0	0	to	90	0	0
Cerium oxalate	lb.	0	3	6	to	0	3	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	11	0	to	0	11	6
Oxide, black	lb.	0	16	0	to		—	
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	29	10	0	to	30	10	0
Cream Tartar, 98-100%	ton	135	0	0	to	140	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol	ton	95	0	0	to	97	0	0
Formusol (Rongalite)	lb.	0	3	9	to	0	4	0
Glauber salts, commercial	ton	5	5	0	to	5	10	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	45	0	0	to	50	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	48	0	0	to	50	0	0
Carbonate (White Lead)	ton	43	0	0	to	46	0	0
Nitrate	ton	48	10	0	to	50	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	26	0	0	to	28	0	0
Magnesium chloride	ton	12	0	0	to	13	0	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	10	10	0	to	11	10	0
Sulphate (Druggists')	ton	15	10	0	to	17	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	70	0	0	to	75	0	0
Methyl acetone	ton	85	0	0	to	90	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	65	0	0	to	66	0	0
Nickel ammonium sulphate, double salt	ton	67	0	0	to	68	0	0
Potash, Caustic	ton	33	0	0	to	33	10	0
Potassium bichromate	lb.	0	0	9	to		—	
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride	ton	36	0	0	to	38	0	0
Chlorate	lb.	0	0	5	to	0	0	5½
Meta bisulphite, 50-52%	ton	120	0	0	to	125	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	1	2	to	0	1	4
Prussiate, red	lb.	0	2	4	to	0	2	6
Prussiate, yellow	lb.	0	1	2½	to	0	1	3
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt.	3	5	0	to		—	
Seconds	cwt	3	0	0	to		—	
Sodium acetate	ton	28	0	0	to	30	0	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	6½	to	0	0	7
Bisulphite, 60-62%	ton	25	0	0	to	27	10	0
Chlorate	lb.	0	0	4½	to	0	0	5
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	10	0	to	26	0	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	15	0	0	to	16	0	0
Nitrite, 96-98%	ton	40	0	0	to	42	0	0
Phosphate, crystal	ton	23	10	0	to	25	10	0
Perborate	lb.	0	1	6	to	0	1	7
Prussiate	lb.	0	0	8½	to	0	0	9
Sulphide, crystals	ton	17	0	0	to	18	0	0
Sulphide, solid, 60-62%	ton	24	10	0	to	25	10	0
Sulphite, cryst	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	80	0	0	to	85	0	0
Strontium Nitrate	ton	70	0	0	to	72	10	0
Strontium Sulphate, white	ton	7	10	0	to	8	10	0
Sulphur chloride	ton	41	0	0	to	42	0	0

	per	£	s.	d.		£	s.	d.
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0
Tartar emetic	lb.	0	1	6	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Tin Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6
Zinc chloride, 102 Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96-98%	ton	50	0	0	to	55	0	0
Oxide, 99%	ton	40	0	0	to	42	0	0
Dust, 90%	ton	47	10	0	to	50	0	0
Sulphate	ton	21	10	0	to	22	10	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	3	3	to	0	3	6
Alphanaphthol, refined	lb.	0	3	9	to	0	4	0
Alphanaphthylamine	lb.	0	2	6	to	0	2	8
Aniline oil, drums extra	lb.	0	1	5	to	0	1	6
Aniline salts	lb.	0	1	6	to	0	1	7
Anthracene, 40-50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	4	3	to	0	4	6
Benzidine, base	lb.	0	6	0	to	0	6	6
Benzidine, sulphate	lb.	0	6	6	to	0	7	0
Benzoic acid	lb.	0	2	3	to	0	2	6
Benzoate of soda	lb.	0	2	3	to	0	2	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	5	9	to	0	6	0
Betanaphthol	lb.	0	2	3	to	0	2	6
Betanaphthylamine, technical	lb.	0	9	0	to	0	9	6
Croceine Acid, 100% basis	lb	0	4	6	to	0	5	0
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	6
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	6	to	0	1	8
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	3	9	to	0	4	0
Diphenylamine	lb.	0	4	6	to	0	4	9
H-Acid	lb.	0	8	0	to	0	8	6
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	6	to	0	7	0
Monosulphonic Acid (2:7)	lb.	0	7	0	to	0	7	6
Naphthionic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	4	9	to	0	5	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	3	to	0	1	4
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	12	0	to	0	12	6
Para-amidophenol, hydrochlor	lb	0	12	6	to	0	13	0
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	6	to	0	4	9
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	13	0
Paratoluidine	lb.	0	7	0	to	0	7	6
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	5	0	to	0	5	6
Resorcin, pure	lb.	0	8	0	to	0	8	6
Salol	lb.	0	2	6	to	0	2	9
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	6	6	to	0	7	0
Tolidine, mixture	lb.	0	2	6	to	0	2	9

French Potash

REALISING the impossibility of further heavy fluctuations, buyers who were inclined to postpone orders in the hope of obtaining lower quotations, are now settling down to purchase on the best terms offered. Despite the depression affecting the sale of all kinds of agricultural produce, the importation and sale of the less costly grades of potash fertilisers is being fairly well maintained. Prices during the past week remained almost unchanged. Fertiliser manufacturers are now relying largely on muriate of potash, the unit price of which is below pre-war level. There is also more interest in potash manure salts (20 per cent. sylvinite), which, owing to lower freight charges per unit, is considered to be the most economical form for direct application.

During September 27,078 tons of CRUDE AND OTHER OILS were imported into Swansea

Company News

NOBEL INDUSTRIES.—The transfer books for the 8 per cent. seven-year secured notes will be closed from October 18 to 31.

FORSTER'S GLASS CO., LTD.—The transfer office has been removed to St. Margaret's House, 57-59, Victoria Street, S.W.1.

GLENBOIG UNION FIRECLAY CO., LTD.—The annual general meeting will be held at 48, West Regent Street, Glasgow, on October 21, at noon.

ANGLO-CHILIAN NITRATE & RAILWAY.—The new share certificates are now ready for delivery at the company's office in exchange for the old preference and ordinary share certificates.

BURMAH OIL.—The share transfer books and register of members are closed from October 13 to 22, inclusive, preparatory to payment of half-yearly dividends on preference and interim dividend on ordinary shares.

BRADFORD DYERS' ASSOCIATION.—An extraordinary general meeting was held in Bradford on Monday, Sir Milton S. Sharp presiding, for the purpose of confirming the resolution passed on September 23, altering certain of the Articles. On the resolution of confirmation being put to the meeting it was carried unanimously.

ALBY UNITED CARBIDE FACTORIES, LTD.—With reference to a statement from Norway relating to a scheme of reconstruction of the Alby United Carbide Factories, Ltd., the firm point out that preliminary arrangements have now been arrived at for the transfer of the Odda assets to the English syndicate, who have purchased the control of the Tyssefaldene Power Co., and had originally made proposals for the reconstruction referred to. As soon as these preliminary arrangements are completed it is the intention of the directors to call the shareholders together and to submit the proposals to them for their consideration and approval.

LEVER BROTHERS, LTD.—A Stock Exchange announcement states that dealings in 280 seven per cent. preference shares of £1 each, fully paid, Nos. 23,564,663 to 23,564,942; and 140 eight per cent. "A" preference shares of £1 each, fully paid, Nos. 15,468,404 to 15,468,543, have been specially allowed by the Committee under Rule 148*a*. These securities will rank *pari passu* with those in which special settling days have already been appointed, as soon as they are identical and the certificates are ready for distribution, and with those for which an official quotation has already been granted as soon as they are identical and are officially quoted.

UNITED INDIGO & CHEMICAL COMPANY, LTD.—The report to June 30 last states that after providing for depreciation of plant and machinery, bad debts, directors' remuneration and all other charges, there remains a profit (including £11,716 3s. 9d. brought forward from last year's account) of £41,054 16s. 2d. Deducting Excess Profits Duty and Corporation Profits Tax, estimated at £2,392, there remains £38,662 16s. 2d. From this sum the following dividends already paid have to be deducted: On the preference shares for 12 months to June 30, 1921, at the rate of 5 per cent. per annum, £7,500; on the ordinary shares for six months to December 31, 1920, at the rate of 5 per cent. per annum, £2,187 10s., leaving a net balance of £28,975 6s. 2d., which the directors recommend should be disposed of in payment of a dividend on the ordinary shares, 6 months to June 30, 1921, at the rate of 5 per cent. per annum, £2,187 10s.; in payment of a further dividend of 7½ per cent. on the preference shares, £11,250; in payment of a further dividend of 7½ per cent. on the ordinary shares, £6,562 10s.; leaving to be carried forward to next year's account £8,975 6s. 2d. Meeting at the Chartered Accountants' Rooms, 60, Spring Gardens, Manchester, October 19, at 11 a.m.

Unclaimed Dividends

IT is notified in the *London Gazette* that, in pursuance of the provisions of Section 49 (2) of the Finance Act, 1921, the Lords Commissioners of His Majesty's Treasury have given directions that where any dividend due on any sum of stock to which that section applies is not claimed within a period of five years from the date on which it accrued due or a period of one year from the date on which the stock matures, whichever is the shorter, the dividend so unclaimed shall be paid to the National Debt Commissioners in compliance with the section.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Lyons ...	Chemical and medical products ...	300
Latvia ...	Oils. Applications to the Department of Overseas Trade, 25, Old Queen Street, London, S.W. 1. (Reference No. 4,325/F.R./P.N.)	—
San Francisco	Druggists' supplies; glassware ...	307
Canada ...	Laboratory supplies. Replies to the Canadian Government Trade Commissioner's Office, Portland House, 73, Basinghall Street, London, E.C. 2	—
Montreal ...	Leather; glue	294

French Society of Chemical Industry

Presentation to Sir William Pope

THE first annual meeting of the Société de Chimie Industrielle opened in Paris on Monday morning, under the presidency of M. Dior, Minister of Commerce. Among the foreign delegates were Sir William Pope and Mr. J. A. Reavell, Prince Ginori Conti, representing Italy, and Mr. Frederick Cottrell from the United States of America.

Sir William Pope read a paper on the "Future of Organic Chemistry," in which he laid great stress upon the advantages that Great Britain and France should derive from their vast Colonial Empires.

Sir William's criticisms of German chemical theories, which, he pointed out, had been accepted with humility for something like half a century, were received with applause. At the close of the address M. Dior handed to Sir William Pope the gold medal of the Société de Chimie Industrielle.

In the course of his address on Monday evening M. Georges Claude entered a strong protest against the neglect of science in connexion with industry and national defence. In the future, he said, agriculture, industry and national defence must be founded upon science. It was absolutely necessary to save science in order to save the country.

The Geology of Petroleum

Co-operation between Chemists and Geologists

AS previously announced in THE CHEMICAL AGE arrangements have been made by the Governors of the Sir John Cass Technical Institute, Jewry Street, Aldgate, for a course of instruction in Petroleum Technology, constituting a course of lectures. The first lecture, on the "Geology of Petroleum," was given on Monday evening by Mr. E. H. Cunningham Craig before a large audience. By means of lantern slides the lecturer pointed out that the majority of the world's oilfields are found along the great mountain chains. Showing slides of sections through these chains he pointed out the forms of earth waves, and showed how coal, oil and gas respectively were found on each side of the mountains. Mr. Cunningham Craig, referring to the isolated work done by chemists and geologists on the subject of petroleum, said it was most important that there should be the maximum of co-operation between the chemist and the geologist.

Dealing with a few of the fallacies which existed with regard to petroleum, the lecturer said that the anticlinal theory was overdone. Oil moved in all directions, and not only upwards as was sometimes suggested. In this connexion he thought that the existence of the Fort Norman oilfield was only due to downward migration from denuded strata, and was not, in his opinion, likely to be much good.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Company Winding-up Voluntarily

USHER'S DRUG STORES, LTD.—Ernest Peters, "Hereward," Albany Road, Sittingbourne, appointed liquidator. Meeting of creditors at "Charville," Albany Road, Sittingbourne on October 11, 7.30 p.m.

Notice of Dividend

TIBBITTS, CHARLES WILLIAM, Oakleigh, London Road, Mitcham, Surrey, and Anderton, Harry James, 59, Welldon Crescent, Harrow, Middlesex, carrying on business under the style of The Carlton Dry Cleaning & Dyeing Works, Church Road, Mitcham, dyers and cleaners. Amount per £ 3s. First and final (amended notice) payable October 13. Offices of the Official Receiver, 132, York Road, Westminster Bridge Road, S.E.1.

Liquidator's Notice

COMMERCIAL CHEMICALS (MANCHESTER), LTD. (in voluntary liquidation).—General meeting of company at Room No. 37, 90, Deansgate, Manchester, on Friday, November 11, 1921, at 12 noon precisely, to receive report of winding-up. A. R. Webb, Liquidator.

Deed of Assignment

KIRK, ARTHUR, late 72, Emmanuel Road, Balham, now Nevells Cottage, Nevells Road, Letchworth, chemist and druggist, M.P.S. Trustee, P. S. Booth, Kimberley House, 14-17, Holborn Viaduct, E.C., account filed October 8. Liabilities unsecured, £1,355; assets, less secured claims, £590. Creditors include: Barclay & Sons, Ltd., Evans Sons, Lescher & Webb, Ltd., Houghton Ltd., Idris & Co., Ltd., Pears (A. & F), Ltd., Piesse & Lubin Ltd., Turner Drug & Galerical Co., Ltd., Wright, Layman & Umner, Ltd., Vionlia Co., Ltd.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BOWMAN'S CASH DRUG STORES, Lowther Arcade, Carlisle, druggists. £15 15s. 10d. August 25.

HIRST & CO., LTD., Chesterfield Road, Dronfield, soap manufacturers. £14 12s. 7d. August 29.

QUESTED, Mrs. M. (married), 32, Plumstead Road, S.E., chemist. £10 14s. September 6.

STANSFIELD, J. L., Boothfold, Waterfoot, near Manchester, chemical manufacturer. £31 17s. 10d. August 25.

WHEELTON COP DYEING CO., LTD., Wheelton, Chorley, bleachers. £14 12s. 6d. August 27.

BIRKETT, Mrs. W., 189, East India Dock Road, druggist. £10 9s. 3d. September 6.

GOUTRID, LTD., 220, Westminster Bridge Road, S.E., patent medicine manufacturers. £16 19s. 7d. September 2.

MOODY, W. E., 4, Market Place, Driffield, chemist, £16 8s.9d. September 2.

STEWART'S PHARMACY, 522, Barking Road, Plaistow, chemists. £14 8s. 7d. September 2.

LEONARD MELLOR,
Chemical Plumber and Lead Burner,
Telephone No. 22. **BACK LANE, WAKEFIELD.**
MAKER OF ALL KINDS OF CHEMICAL PLANTS.
Quotations Strictly Nett. Repairs Promptly Attended To. Distance No Object.
Quotations from Own Drawings.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2:—

STOURBRIDGE GLASS CO., LTD., Audnam, Kingswinford, Stafford.—Glass manufacturers. Nominal capital, £35,000 in 35,000 shares of £1 each. Directors: H. R. Guest, Amblecote, Staffordshire; A. Horton, Overdale, Collis Street, Amblecote, Staffordshire.

BRITISH STANDARD CENTRIFUGAL PUMP CO., LTD., Kent Green, Scholar Green, Stoke-on-Trent.—Manufacturers of pumps. Nominal capital, £3,000 in 3,000 shares of £1 each. Director: A. H. Thompson, 7, Hoveden Road, Cricklewood, N.W.

KEPEC CO. (ENGLAND), LTD., Myrtle House, Gay Lane, Otley, West Riding, York.—Manufacturers of and dealers in colour and leather finishes, tanning materials, &c. Nominal capital, £13,000 in 1,300 shares of £10 each. Directors: W. M. Pohl, 476, Forth Street, Milwaukee, Wisconsin, U.S.A.; T. W. Barker, Greenroyd, Otley, Yorks; N. L. Barker, Grosvenor Terrace, Otley, Yorks; P. R. Barker, Thorn Croft, Otley, Yorks; H. Clayton, Long Row, Horsforth, Yorks.

ANGOLA OILFIELDS, LTD., Capel House, 52, New Broad Street, E.C.2.—To enter into two agreements with the Trade & General Trust, Ltd., and to acquire any petroleum, asphalt, naphthalene, coal or oil-bearing lands in any part of the world, and turn same to account. Nominal capital, £1,000,000 in 1,000,000 shares of £1 each. Directors to be appointed by subscribers. Qualification of directors, £500.

RAPIDOL, LTD., 20, Old Cavendish Street, W.1.—Manufacturers of a certain compound known as "Rapidol," and manufacturers of hair-dyes, toilet preparations, &c. Nominal capital, £5,000 in 5,000 ordinary shares of £1 each.

WALKER, JAMES (BOTTLES), LTD. Manufacturers of glassware and earthenware. Nominal capital, £5,000 in 5,000 shares of £1 each. Directors: W. Bennett, W. K. Hollely, G. Rawlins. Qualification of directors, 1 share.

Public Examination of F. T. Jowett

THE public examination of Frank Thornton Jowett, 14, Cannon Place, Brighton, Sussex, formerly trading at the City & Midland Manufacturing Co., 31A and 33, Broad Street House, London, was held recently at Brighton. According to the statement of affairs, the liabilities amounted to £1,216, but the debtor stated that this did not include an amount of £500 due to one firm. There were no assets. It appeared that formerly he was in partnership with a brother, but they sold up, and debtor joined the army during the war. He was left with about £200. On leaving the army in March, 1919, he was employed as a chemical salesman. In May, 1920, he started the City & Midland Manufacturing Co. He contracted to purchase goods of the value of £1,612 from a certain firm, but did not accept delivery of a part of it, and an action for £824 was started against him. The examination was adjourned.

Proposed Reduction of Chemical Workers' Wages

AS announced in THE CHEMICAL AGE last week the United Alkali Co., Ltd., have given notice to their employees of a reduction in wages of 5s. per week. In this connexion the Press Association learns that none of the firms who are at present associated with the Chemical Trades' Industrial Council have tendered any notice of wage reductions. The firms, it is stated, base their claim for a reduction on the lower cost of living, and maintain that with the proposed reduction the men's wages will still be about thirty-five points in excess of the present cost of living standard. This, however, is contested by the trade unions concerned. The National Federation of General Workers have written to the United Alkali Company asking them to suspend the notice pending a conference with their representatives. "We have no doubt that the firm will agree to the proposed conference," remarked the secretary of the Federation on Wednesday, "and it is hoped that the matter will be amicably arranged."